INDIA RUBBER WORLD

OCTOBER, 1945

TECHNOLOGY DEPT.

DUSTLESS PELLETS · ST
DISPERSION · FAST
PLASTICITY
FAST
LONG
PROPERTIES ·
EASY PROCESSING ·
UNIFORMITY · GOOD
LOW EXTRACT
OPTIMUM DISPERSION
FAST
TENSILE PROPERTIES · EXCEPTIONAL

Sterling-S
SRF

GODFREY L. CABOT, INC., BOSTON

letter No. 10
OCTOBER, 1945

Published by Rubber Chemicals Division of DU PONT

Where there's a Fire Hazard... NEOPRENE provides safety!

NEOPRENE won't support flame. It chars, yes. But as soon as flame is removed, combustion ceases. There is no smoldering. And properly compounded neoprene shows high flame resistance —making it safe and desirable for use wherever a fire hazard is present.

In the chimney-burning test* where a 6-inch strip is suspended over a Bunsen flame, a natural rubber stock ignites at once and is completely consumed after 10 seconds. Under the same test, a properly compounded strip did not ignite, even though exposed to the flame for 5 minutes . . . merely showed charring of less than half its length.

When you need resilient compositions for use in products for homes, public conveyances, theatres, ships, planes and factories, remember—neoprene helps provide safety against fire!

For complete information about neoprene, write E. I. du Pont de Nemours & Co. (Inc.), Rubber Chemicals Division, Wilmington 98, Delaware.

*Send for Report BL-180, "Flame-Proofing—Neoprene vs. Rubber," if you do not have it in your files.

DU PONT

RUBBER CHEMICALS DIVISION

BETTER THINGS FOR BETTER LIVING . . . *Through Chemistry*

India Rubber World, October, 1945, Vol. 113, No. 1. Published monthly by Bill Brothers Publishing Corp., 386 Fourth Avenue, New York 16, N. Y., U. S. A. Entered as second-class matter December 27, 1944, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Subscription, United States and Mexico, $3.00 per year, all other countries, $4.00; single copies, 35 cents.

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OCT 2 8
DETROIT

★

When the Atomic Bomb hit Taylor's...

THE Atomic Bomb landed on American industry long before it devastated Hiroshima and Nagasaki. Maybe it hit you harder than it hit us. All we know is that here at Taylor Instrument, it had an impact not only on our own organization, but on our suppliers and our customers. Here is what happened:

On a spring day in 1943, the War Department called us in to ask us if we would assume the responsibilities of prime contractor on process control instrumentation for the Kellex Corporation for a secret project called the "Manhattan District." As everybody knows now, this was the Oak Ridge Atomic Bomb Project.

We were already supplying instruments to eleven major branches of the armed forces. Commitments to the super-critical synthetic rubber, 100-octane gasoline and chemical industries programs imposed heavy responsibilites. On top of this, war industries' needs were increasing. Materials were scarce and manpower scarcer. But we were told this was an opportunity to help shorten the war. So of course there could be but one answer.

Our responsibilities included the development, design and production — in unprecedented quantities — of a score of new types of instruments, involving new principles, and closer operating tolerances than had ever before been required of process control instruments. In addition, we were asked to loan a number of our top engineers and technicians to the project.

Our production schedules had to be overhauled. Directives over-rode high-rated war orders. Civilian orders stood at the far end of the line. But the problems were solved, because thousands of people in our plants and in those of our subcontractors devoted their whole time to the project to the extent of seven days a week, month after month.

Naturally, we're proud of the way our organization came through. But we're proud too of our many, many customers who showed patience and understanding in the face of temporary delays in delivery for which we could only offer phoney-sounding excuses. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. *Taylor Instruments mean "Accuracy First."*



PHILBLACK A

Can Take It!

You can say that again! Tires made with Philblack A give greater total mileage. Yes, actual road tests with a number of fleets have proved that Philblack A increases tire life through better resistance to cuts, cracks, heat build-up and abrasion.

That's the reason why so many manufacturers of tires are now using Philblack A. But there are other reasons, also. Philblack A speeds up processing. Cuts down defectives. Gives better looking products.

Because of the increased demand for wonder-working Philblack A, we have stepped up our production 16 million pounds per year. If you are interested in this *easier* way of manufacturing *better* rubber products, write for full details and prices.

PHILLIPS PETROLEUM COMPANY

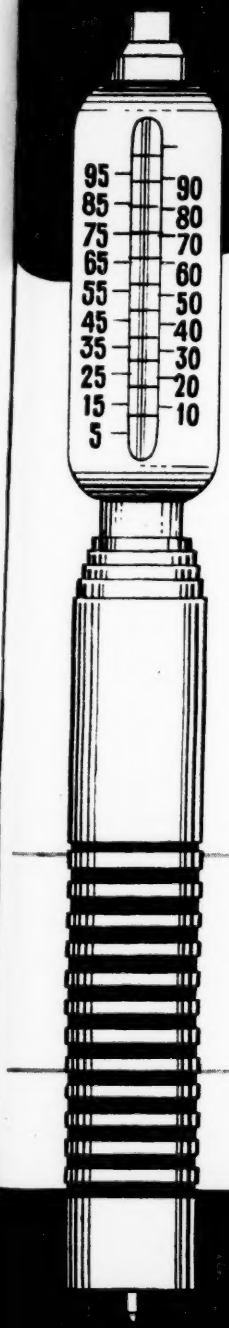
***Philblack* Division**

FIRST CENTRAL TOWER BUILDING · AKRON, OHIO

Announcing

THE REX GAUGE

AN INSTRUMENT FOR DETERMINING THE HARDNESS OF RUBBER VULCANIZATES OR OTHER MATERIALS WITHIN THE HARDNESS RANGE



- ☆ A New Type of Hardness Gauge for the Rubber Industry.
- ☆ Simple to Operate.
- ☆ Easy to Apply to Out-of-the-Way Positions.
- ☆ Gives Fixed Reading with One Application. No Fluctuation of Reading.
- ☆ Agreed Readings by Different Operators.
- ☆ Permanently Adjusted — No Calibration.

Supplied with Carrying Case and Attached Magnifier

A Necessary Instrument for Manufacturers, Purchasers and Consumers of Rubber Products.

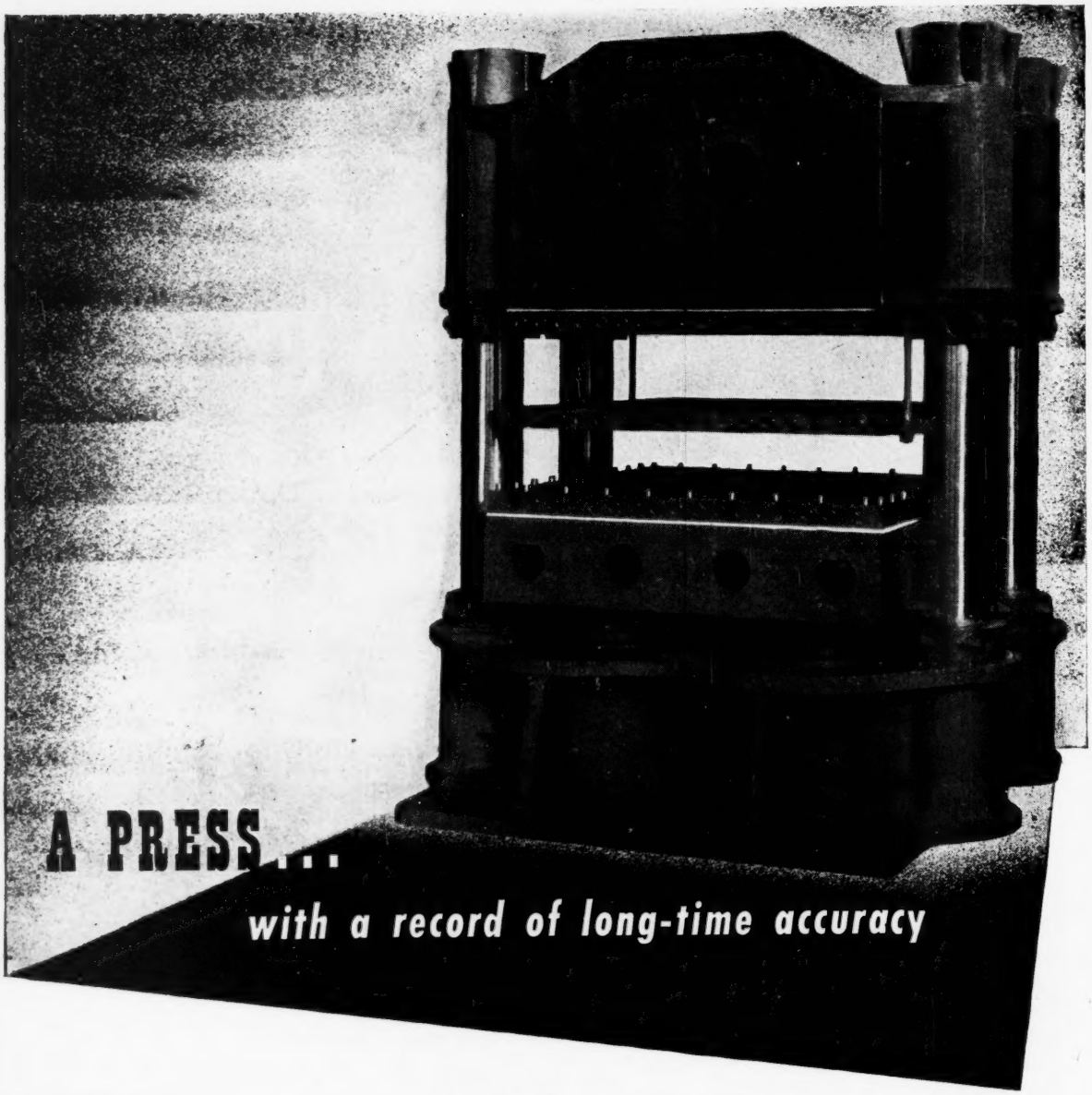
Write for Descriptive Folder and Quotation.

Distributed by

NAUGATUCK CHEMICAL

Division of United States Rubber Company

ROCKEFELLER CENTER, 1230 SIXTH AVENUE · NEW YORK 20, N. Y. · BRANCHES: AKRON — BOSTON — DETROIT



Specifications

Press capacity	1588 tons
Diameter of rams	17"
Stroke of rams	20½"
Size of steam platens	60" x 60" x 3½"
Height of openings	10¼"
Maximum working pressure	3500 psi

This heavy, accurate, four-column steam platen press is designed for curing sheet packing, composition packing, shapes and other rubber products. Such a press may fit into your plans for the future. Wood makes this press in various sizes and capacities up to 2500 tons; and many other types of hydraulic presses you may need to aid in increasing output and reducing costs. We will gladly quote on your requirements. Write us today, outlining them.

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE

EST. 1803 R. D. WOOD CO. PUBLIC LEDGER BUILDING INDEPENDENCE SQUARE PHILADELPHIA 5, PA.



Then WAR Now PEACE

HYCAR...still working for you

THIS advertisement, dealing with a wartime subject, represents what HYCAR has been doing to help you in the past and what it intends doing for you in the future. The copy tells men in every industry—through the advertising pages of Business Week, Newsweek, U. S. News, and 12 other carefully selected business papers with a combined circulation of over 1,000,000 readers—how parts made from HYCAR can help improve performance, save money, and reduce maintenance expense because HYCAR parts last longer; give *dependable* service.

The only place these men in industry—men who directly influence the purchase and use of rubber parts—can get these HYCAR parts is from you. That's why we tell them—"ask your supplier for parts made from HYCAR."

We make no finished parts of HYCAR. We can only supply *you* the raw synthetic rubber from which parts can be made. That's why the next move is up to you. We have opened the door so that *you* can get inside.

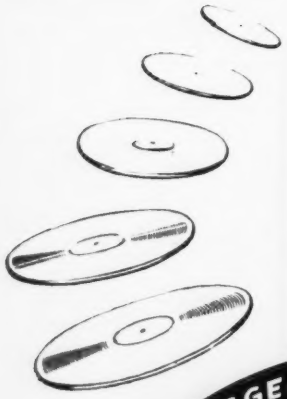
Reprints of all HYCAR advertisements for use by your salesmen are yours for the asking—at no cost to you. Please send your requests to *Hycar Chemical Company, Akron 8, Ohio.*

Hycar

Reg. U. S. Pat. Off.

LARGEST PRIVATE PRODUCER OF BUTADIENE TYPE

Synthetic Rubbers



A BALDWIN PRESS

for making a lot of new records







With great activity in the phonograph record business at present—and more in prospect—Baldwin engineers have focused their years of experience on producing a press that combines all essential features listed.

This press is definitely NOT built to meet "price" competition. It is a 100% quality product, that makes its savings through maximum production, minimum rejects, and low maintenance.

The press produces either 10-inch or 12-inch blanks. It is a slab sided unit, with long adjustable guides on the moving platen, which bear on four-position, accurately machined surfaces on the side members. The cylinder throat has a long bushing. These features combine to maintain true platen alignment at all times. Moving parts are provided with a rapid spring return.

Write for details on this important Baldwin development.

The Baldwin Locomotive Works, Baldwin Southwark Division, Philadelphia 42, Pa., U. S. A. Offices: Philadelphia, New York, Washington, Boston, Cleveland, Chicago, St. Louis, Houston, San Francisco, Pittsburgh, Detroit.

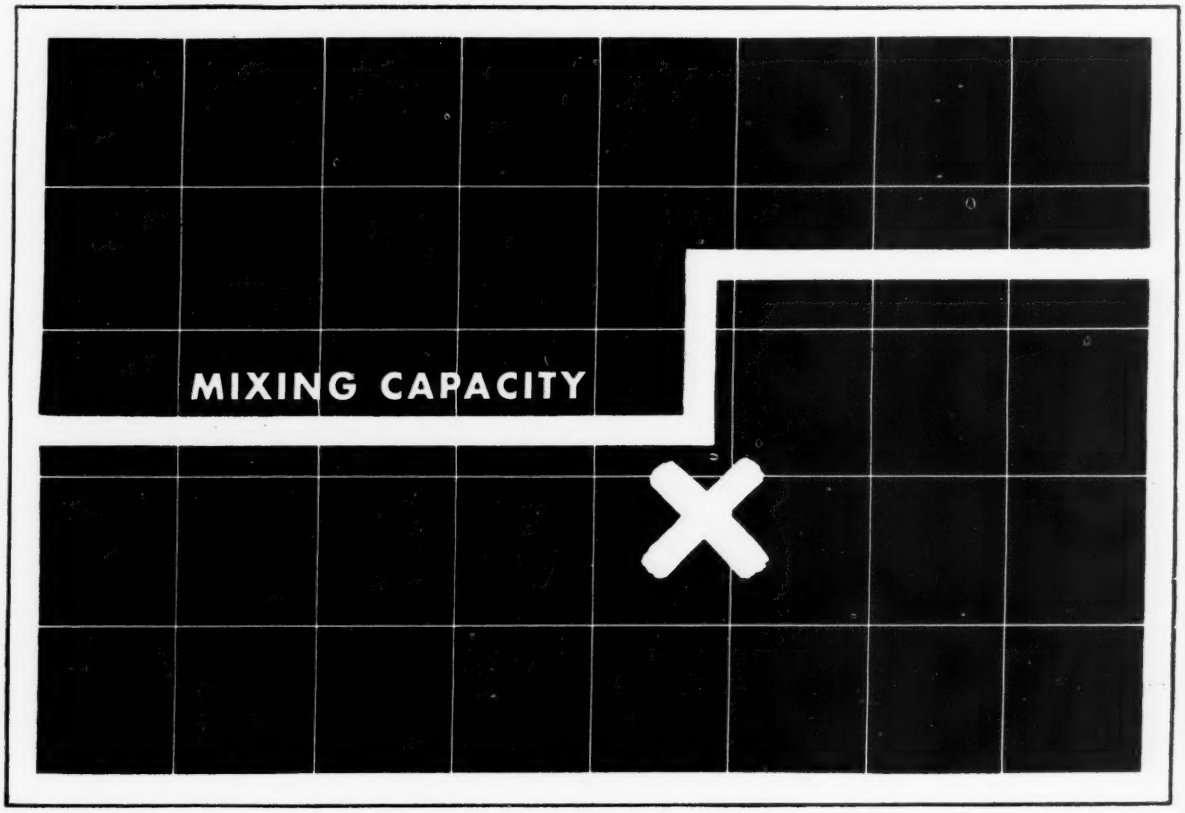




BLW THE BALDWIN GROUP **BALDWIN**
SOUTHWARK
HYDRAULIC PRESSES

X MARKS THE SPOT . . .

WHERE NAFTEX WAS ADDED



NAFTEX is a combination of SRF or HMF black and sulfur-reactive plasticizer. Through the use of NAFTEX it may be possible to increase substantially your mixing capacity without increasing your labor or equipment requirements. Our technical representatives will be glad to discuss your particular mixing and compounding problem.

NAFTEX is relatively dustless and is in the form of dry, free-flowing pellets, with the plasticizer uniformly and completely absorbed. Thus, in addition to increased mixing capacity, NAFTEX offers the added advantages of reducing carbon black dust and eliminating the handling of viscous liquid plasticizers. Technical data and laboratory samples are available.

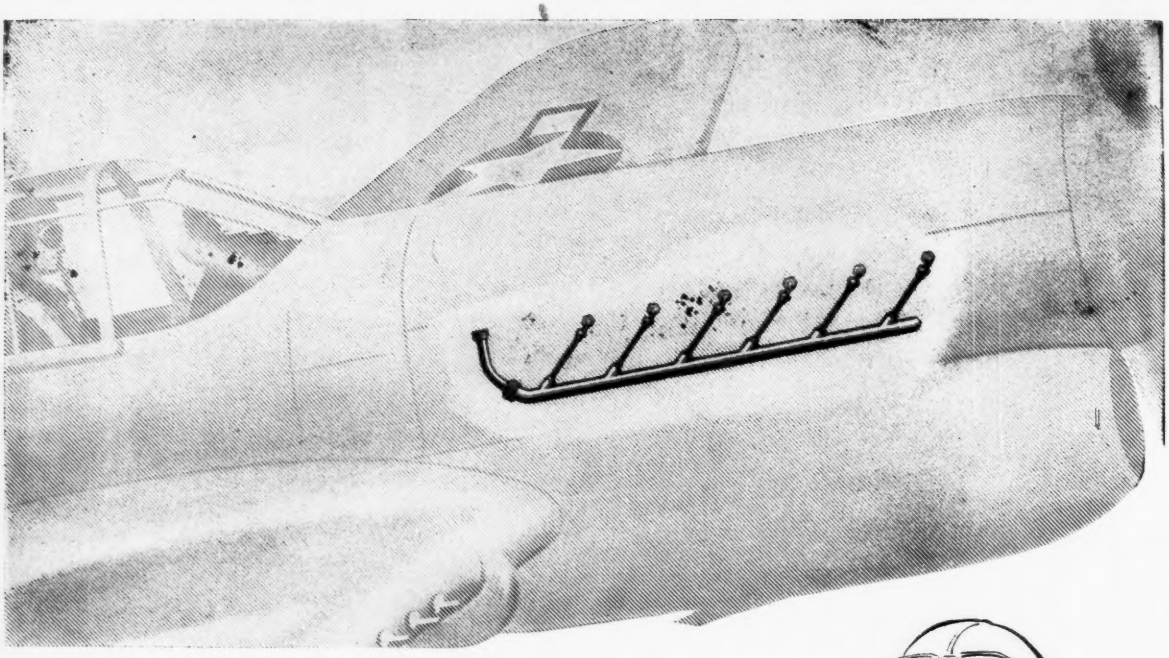
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REG. U. S. PAT. OFFICE

WILMINGTON

CHEMICAL CORPORATION

10 EAST 40TH STREET • NEW YORK 16, N. Y.





Keeping an Ignition System off the Air . . . . . .



Cable after shielding

NS NATIONAL-STANDARD Company NILES · MICHIGAN

BUY AND KEEP WAR BONDS AND STAMPS

EVER hear somebody's electric shaver over your radio? That's the kind of noise, many times multiplied, a pilot would hear in his radio earphones if the ignition wiring on his plane were not properly shielded.

So, to prevent an ignition system from becoming a broadcaster . . . interfering with clear radio reception, the complete ignition harness is enclosed in a sheath of braided copper alloy conduit.

The braided shielding must withstand a wide range of temperature changes, from sub-zero to intense heat . . . the severe vibration of high-powered aviation engines . . . the terrific beating of tremendous wind pressures. Then, too, the higher the altitude the more difficult it becomes to prevent the leakage of electrical current. And to further complicate the problem, radio equipment is being constantly improved for greater sensitivity.

Braiding copper alloy wire for this important shielding function must be a precision job of fabrication to meet the exceedingly high specifications for Army and Navy planes.

Here at National-Standard we have developed methods of producing a uniform high quality of wire braided flexible conduit to successfully meet the extreme service requirements of some of America's fastest flying planes. We do not make the entire insulated cable... only the *tubular shielding* shown above.

Today we have machinery available to braid steel, brass, copper, stainless steel, and monel metal in tubular lengths from 1/16" to 16" in diameter. Perhaps these facilities can be profitably used in your manufacture of rubber or allied products...why not write and find out?

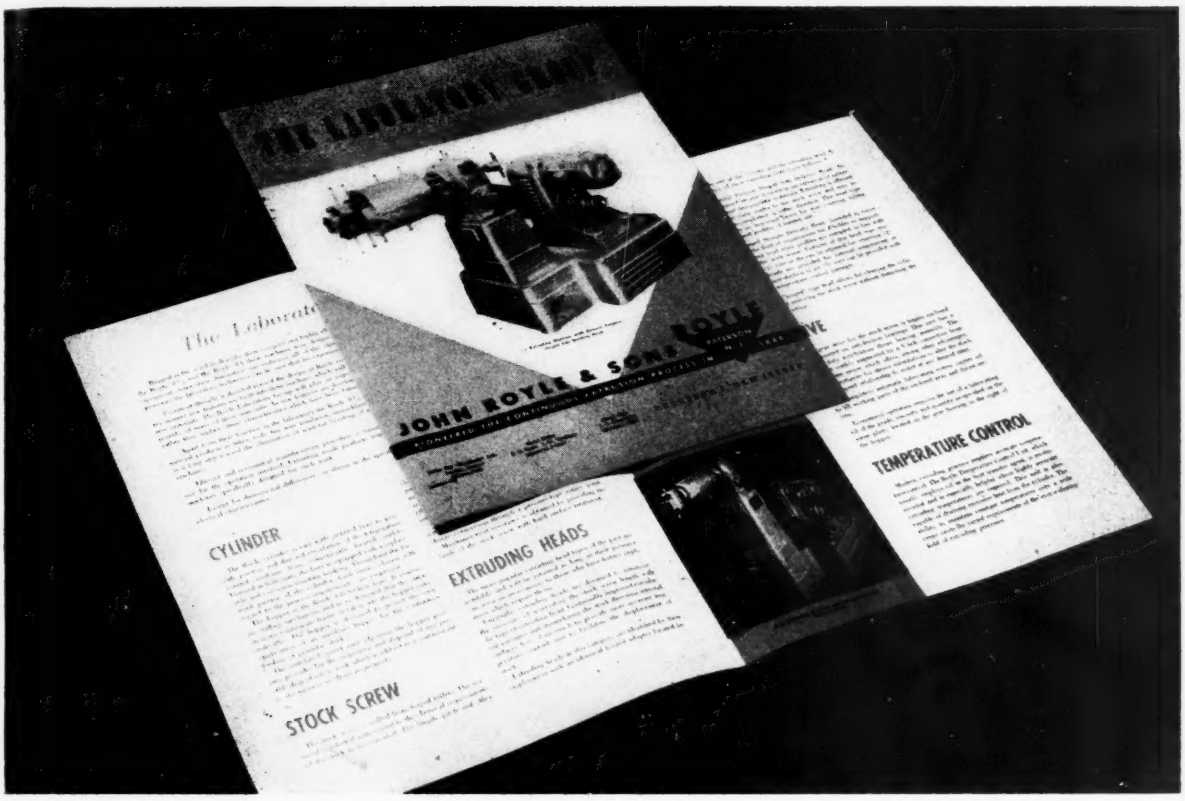
Divisions of National-Standard Company

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TIRE WIRE, FABRICATED BRAIDS AND TAPE

THE ATHENIA STEEL CO.
Clifton, N. J.
COLD ROLLED, HIGH-CARBON SPRING STEEL

WORCESTER WIRE WORKS
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ROUND STEEL WIRE, SMALL SIZES

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HAVE YOU SENT FOR YOUR COPY?

"THE LABORATORY GROUP" will tell you why the Royle #½ and the Royle #1 are the extruding machines you will want to know more about when you plan for the busy years ahead. Through evolutionary development features have been incorporated in these machines which will secure successful results with the growing number of extrudable compounds.

Whether you have plans for research or light product extruding "THE LABORATORY GROUP" will give you basic data you will need . . . If you plan a program of research you will find that the Royle #½ and Royle #1 have the same characteristics found in the larger Royle extruding machines. . . . If you plan to go into light product extruding you will find it more efficient and more profitable to extrude with a Royle designed for light extrusion processes.

Send for your copy of "THE LABORATORY GROUP" and let it suggest to you how Royle extruding machines can meet your specific requirements.

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

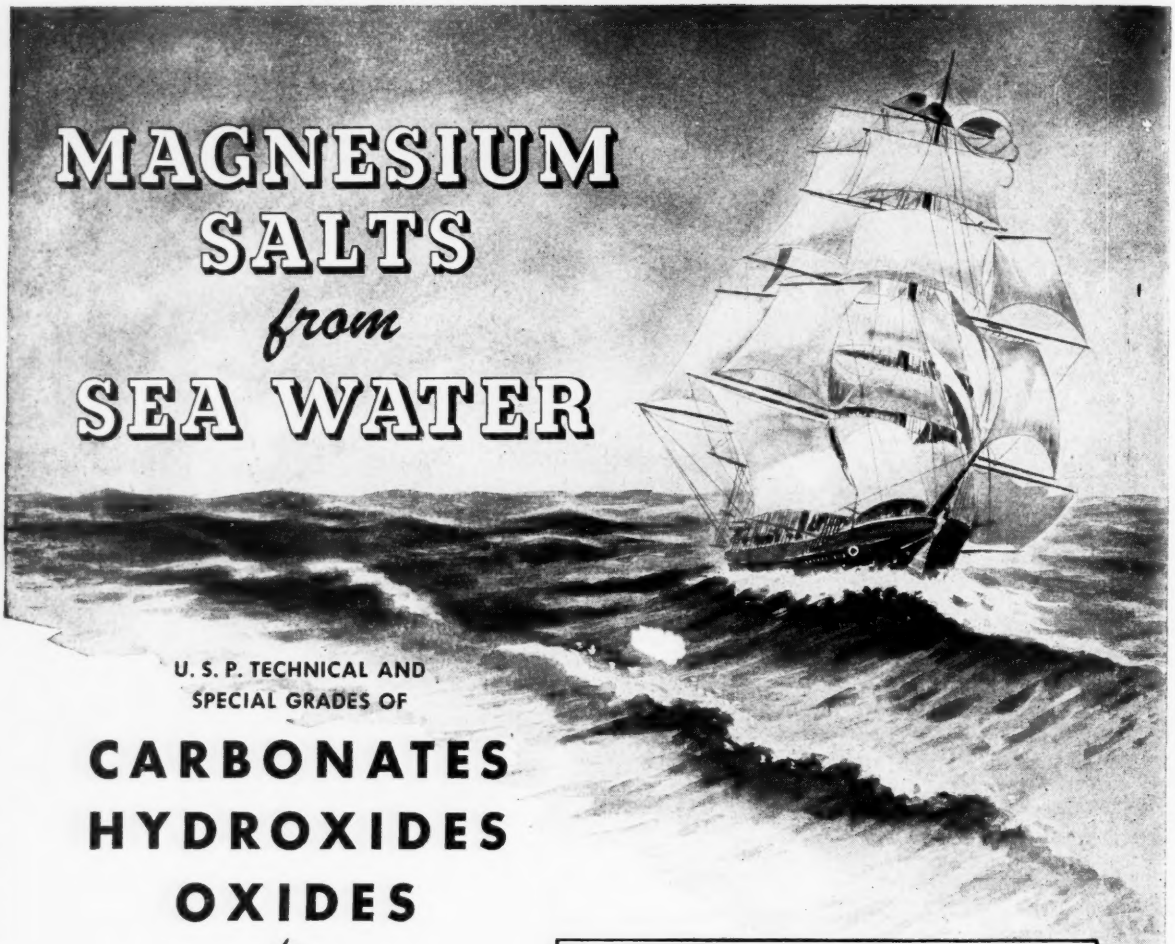
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London, England
REgent 2430

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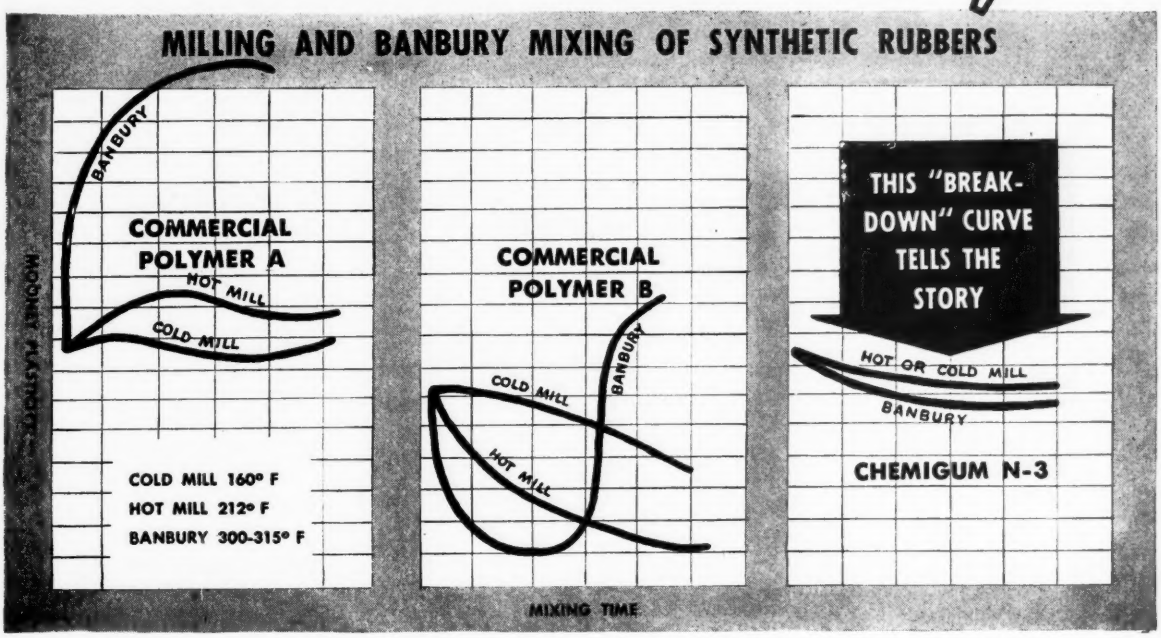
G. S. ROBINS & COMPANY
ST. LOUIS: 126 Chouteau Avenue

MARINE MAGNESIUM PRODUCTS CORPORATION

Original Producers of Magnesium Salts from Sea Water

© 1945, Marine Magnesium Products Corp.

Here's Why CHEMIGUM N-3 handles easier



THE above chart tells you why Goodyear's new Chemigum N-3 is far more satisfactory to work with than other commercial polymers. It is *heat stable*—shows no hardening even when mixed at elevated temperatures for protracted periods.

Along with this greater uniformity, Chemigum N-3 is equally notable for its Low Compression Set, Low Solvent Swell and Good Heat-Aging Characteristics—qualities that eliminate many processing troubles, save time and insure higher quality in your final products.

Chemigum N-3 is recommended for all compounds that call for a Buna-N oil-resistant synthetic base. We can now fill orders in any volume. For sample and processing data, write: Goodyear Chemical Products Division, Plastics and Coatings Dept., Akron 16, Ohio.

Chemigum (pronounced Kem-e-gum)—
T.M. The Goodyear Tire & Rubber Company

GOODYEAR

THE GREATEST NAME IN RUBBER

VISTANEX POLYBUTENE
VISTAC

Now
Freely Available

We are pleased to announce that both Vistanex Polybutene and Vistac have been released from all restrictions and are now available to the industry.

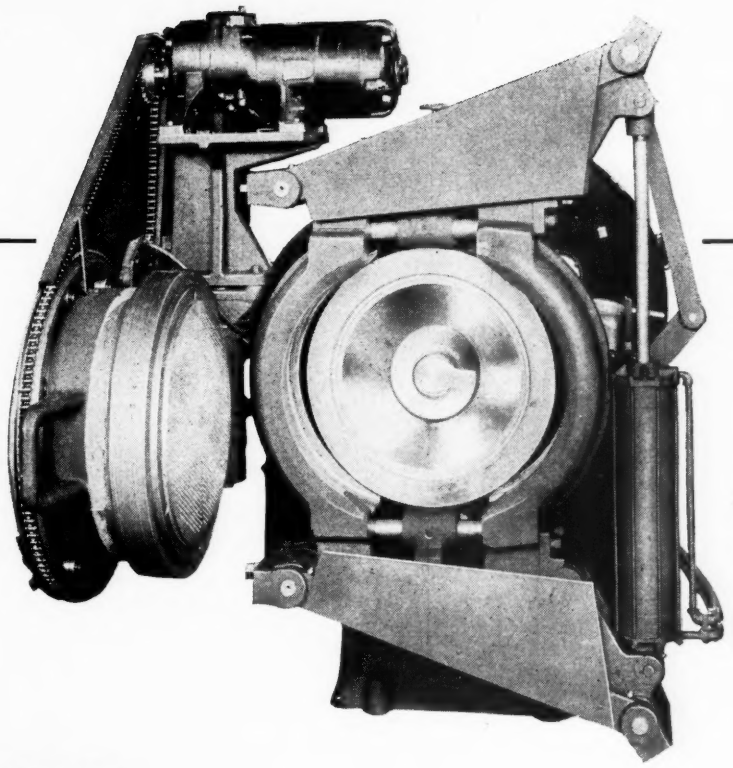
During the war, these materials were only available for highest priority use, but can now be supplied for all purposes.

Vistanex Polybutene and Vistac, being substantially colorless, non-oxidizing, non-vulcanizing hydrocarbons, we particularly recommend these products for pressure sensitive adhesives, adhesive cements and in rubber compounding for superior aging and heat resistance.

Our laboratory will be glad to cooperate with you on your technical problems and supply you with all required data and information.

ADVANCE SOLVENTS & CHEMICAL CORP.

245 Fifth Avenue, New York, N. Y.



for more speed in screen changes, add this strainer head to YOUR EQUIPMENT!

NOW you can have the advantages of this latest development in strainer heads without completely replacing your present equipment.

How? By simply installing a new National strainer head on the machine you now have. So ingeniously is this head designed that it can be adapted to any straining machine now in operation.

You get greater production because screen changes can be made in less than one minute. Making the change is so easy that operators are willing to change them frequently—before clogging causes production slow-down.

Downtime is sharply reduced. Faster screen changes mean as much as 5 or 6 hours more production time in a 24-hour period.

Learn how effective a new National strainer head can be when installed on your *present* equipment . . . and how quickly the change will more than pay for itself. Write National Rubber Machinery Co., 918 Sweitzer Avenue, Akron 11, Ohio.

NATIONAL RUBBER MACHINERY CO.
General Offices: AKRON 11, OHIO

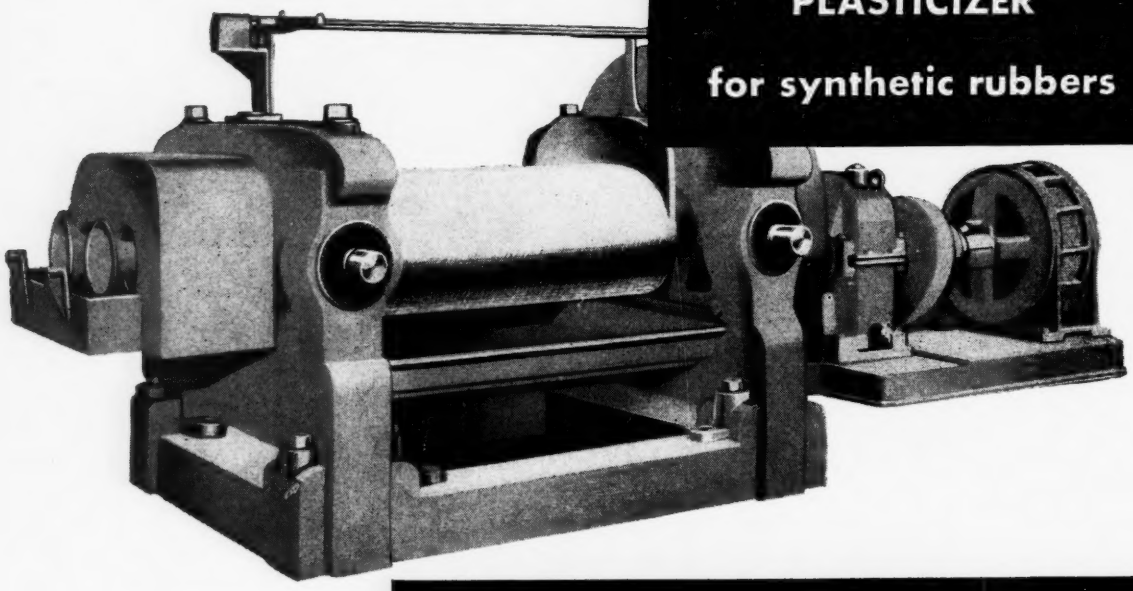
Creative Engineering

WORLD'S LARGEST PRODUCER OF SYNTHETIC RESINS

RCI

answering your demand

for a trustworthy
PLASTICIZER
for synthetic rubbers



RCI
Controlled-Quality

DIBUTYL PHTHALATE

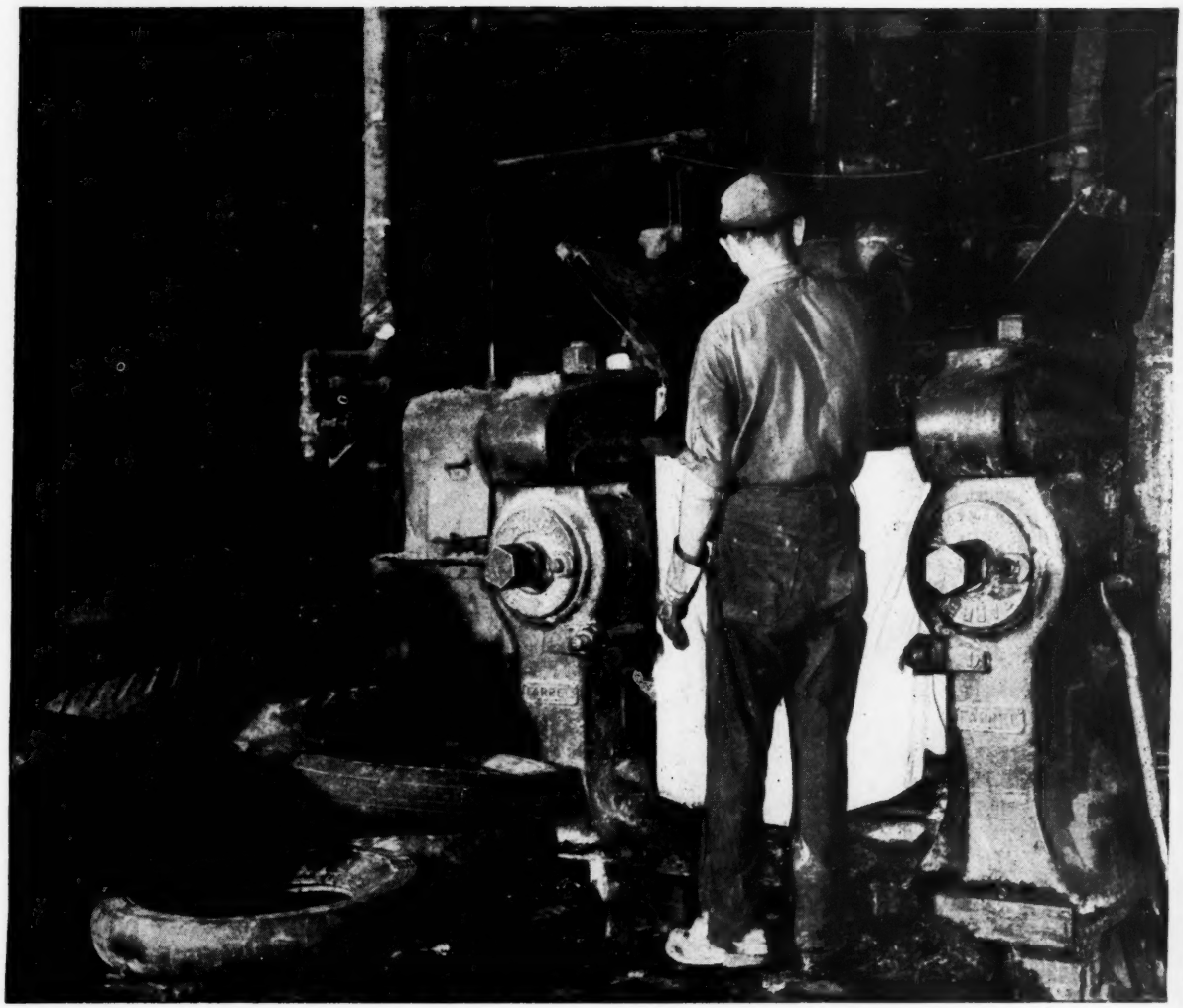
RCI has resumed quantity production of the proved plasticizer for Vinyl, Neoprene and Buna N types of synthetic rubber—dibutyl phthalate. And with the return of this basic chemical to RCI's Line of Raw Materials comes reassurance of uniformity from batch to batch because RCI's system of control guarantees constant quality. Meeting Army Specification 50-11-61A and Army-Navy Specification AN-O-D-361, RCI Dibutyl Phthalate is thoroughly dependable. For further information write direct to the Sales Department.

REICHHOLD CHEMICALS, INC.

General Offices and Main Plant, Detroit 20 Michigan

Other Plants:
Brooklyn, New York • Elizabeth, New Jersey • South San Francisco, California • Tuscaloosa, Alabama • Liverpool, England • Paris, France • Sydney, Australia

CHEMICAL COLORS • SYNTHETIC RESINS • INDUSTRIAL PLASTICS • INDUSTRIAL CHEMICALS



Picture of a man keeping prices down

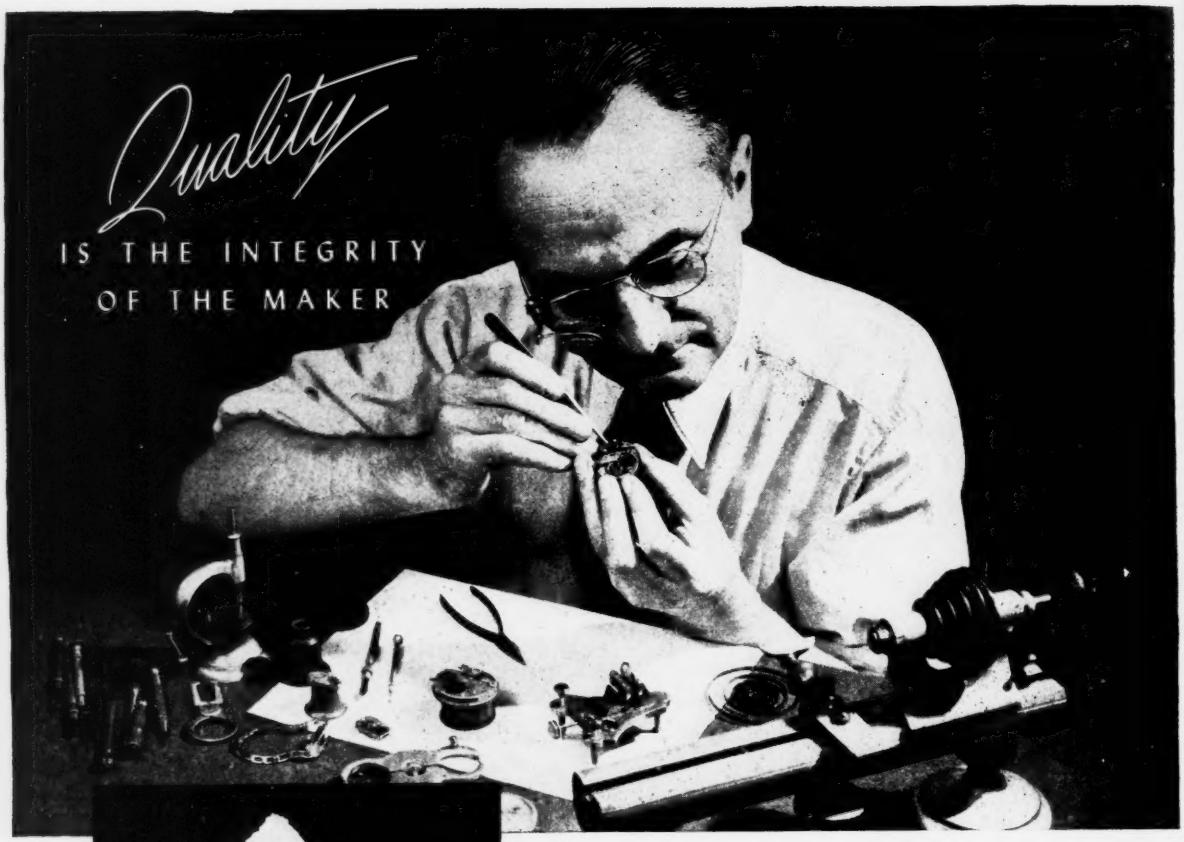
HE'S a worker in a reclaimed rubber plant—making Philadelphia reclaimed rubber. Regardless of the supply of synthetic or natural rubber, Philadelphia reclaim is *still* the most economical material to use in the manufacture of many rubber products. And that means prices of these products can be kept *down* while profits, even in a rapidly returning competitive market, can be kept at fair level.

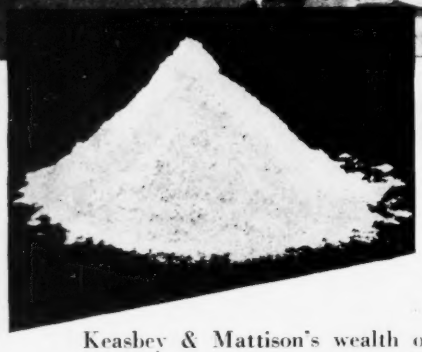
We make no claim that Philadelphia reclaim is a miraculous answer to all your problems. There are still and will continue to be thousands of uses for natural and synthetic rubber in all industry. But Philadelphia reclaimed rubber will retain its important place as an economical, stable, dependable compounding material.

And Philadelphia Rubber's technical staff will continue at your service to help you solve any problem having to do with reclaimed rubber—natural or synthetic. The Philadelphia Rubber Works Co., 324 Rose Bldg., Cleveland 15, Ohio.

PHILADELPHIA
RECLAIMED RUBBER

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K&M LIGHT MAGNESIUM OXIDE

...has been depended upon for years for the most exacting needs

Keasbey & Mattison's wealth of experience with Magnesia products over the past 70 years has resulted in rigid inspection standards that make for unsurpassed *quality* in K&M Magnesium Oxide.

Neoprene Compounders know they can depend on K&M Light Magnesium Oxide for quality, economy and uniformity. Complete and careful manufacturing control from raw material to finished product is the answer to this reputation.

Large supplies are available. Prompt warehouse delivery.



KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA
One of America's oldest and most reliable makers of asbestos and magnesia products. Founded 1873

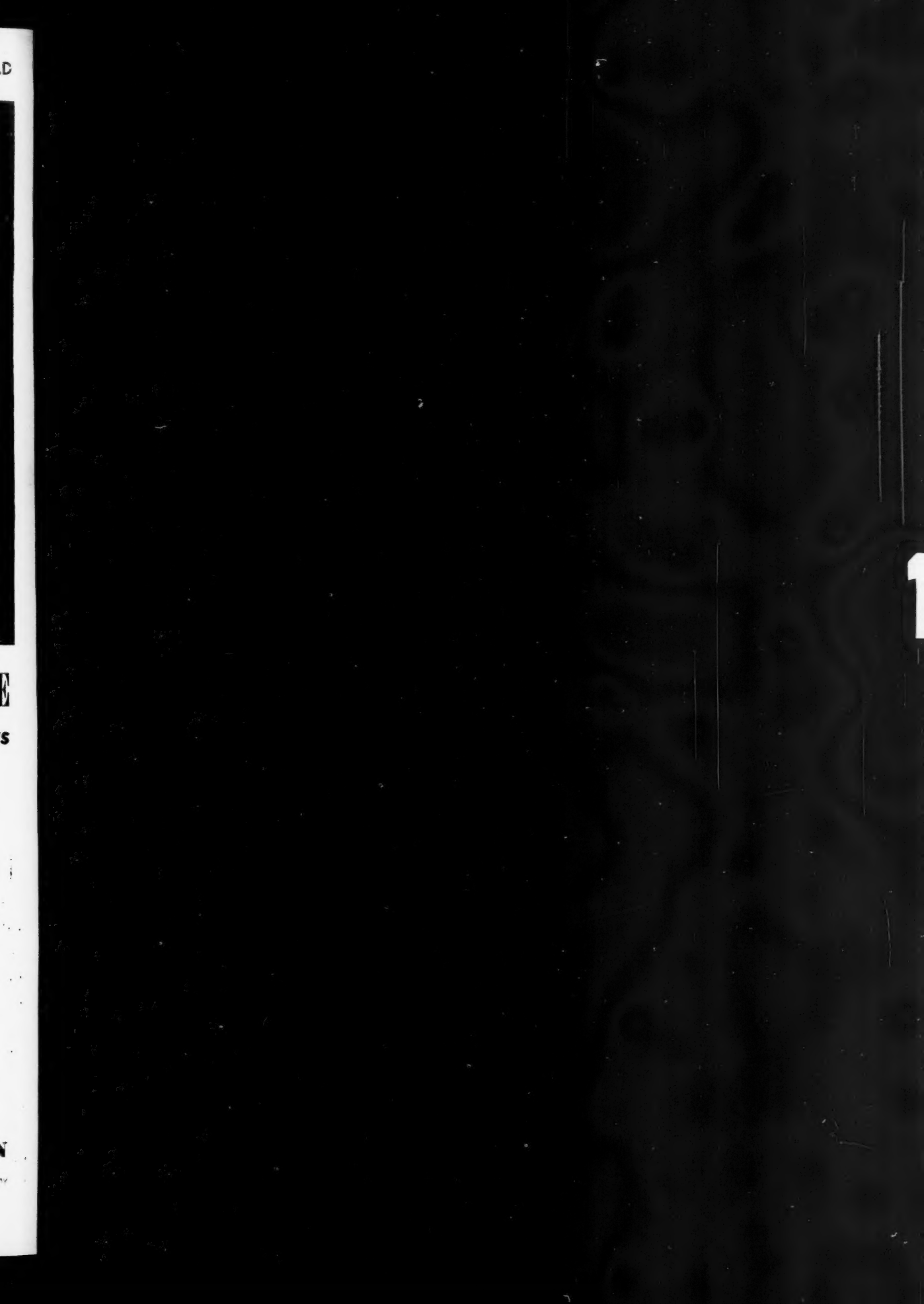
OUR DISTRIBUTOR FOR K&M LIGHT MAGNESIUM OXIDE IS:

AMERICAN CYANAMID & CHEMICAL CORPORATION

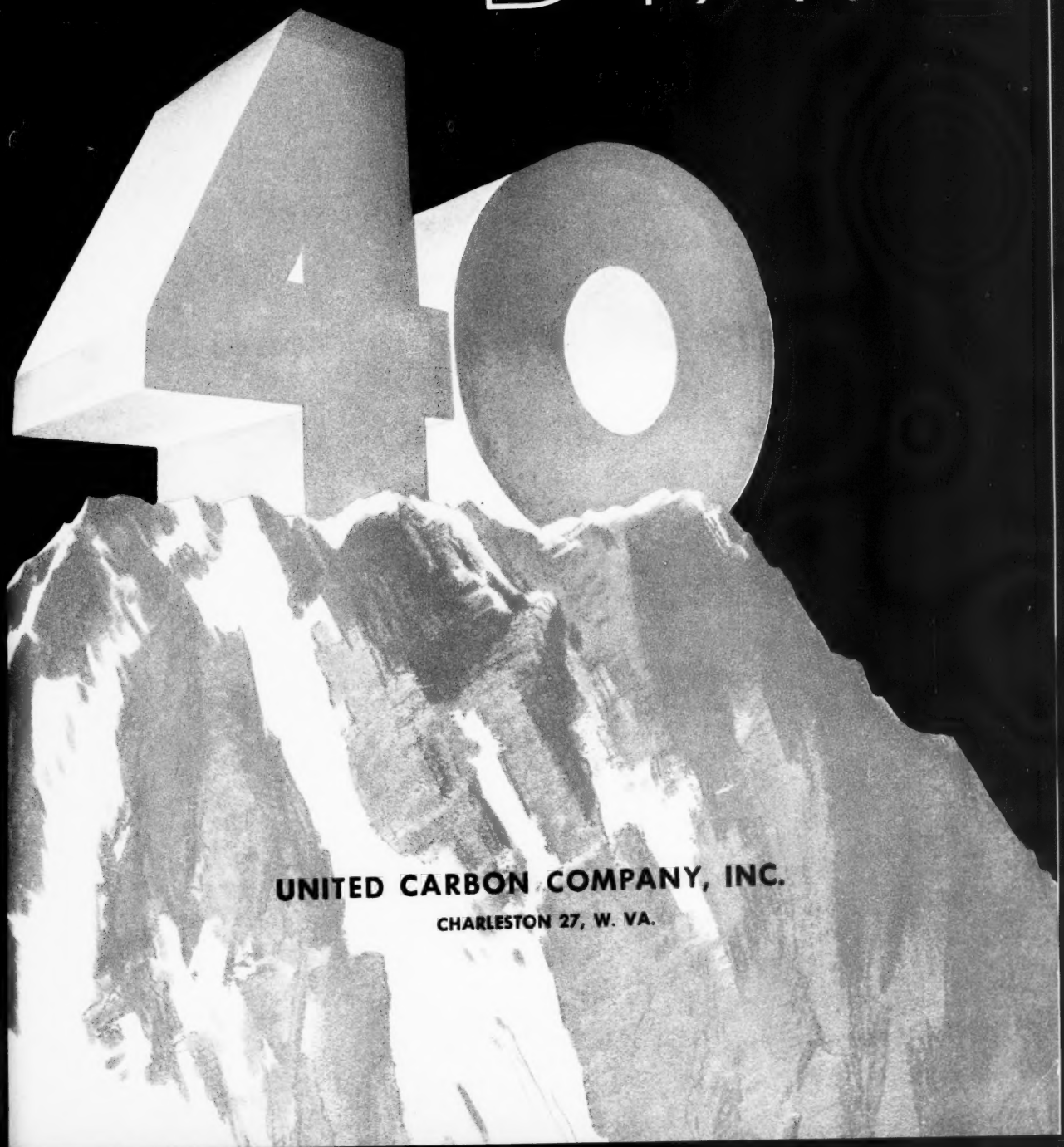
30 Rockefeller Plaza, New York 20, N. Y.

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KOSMOS DIXIE



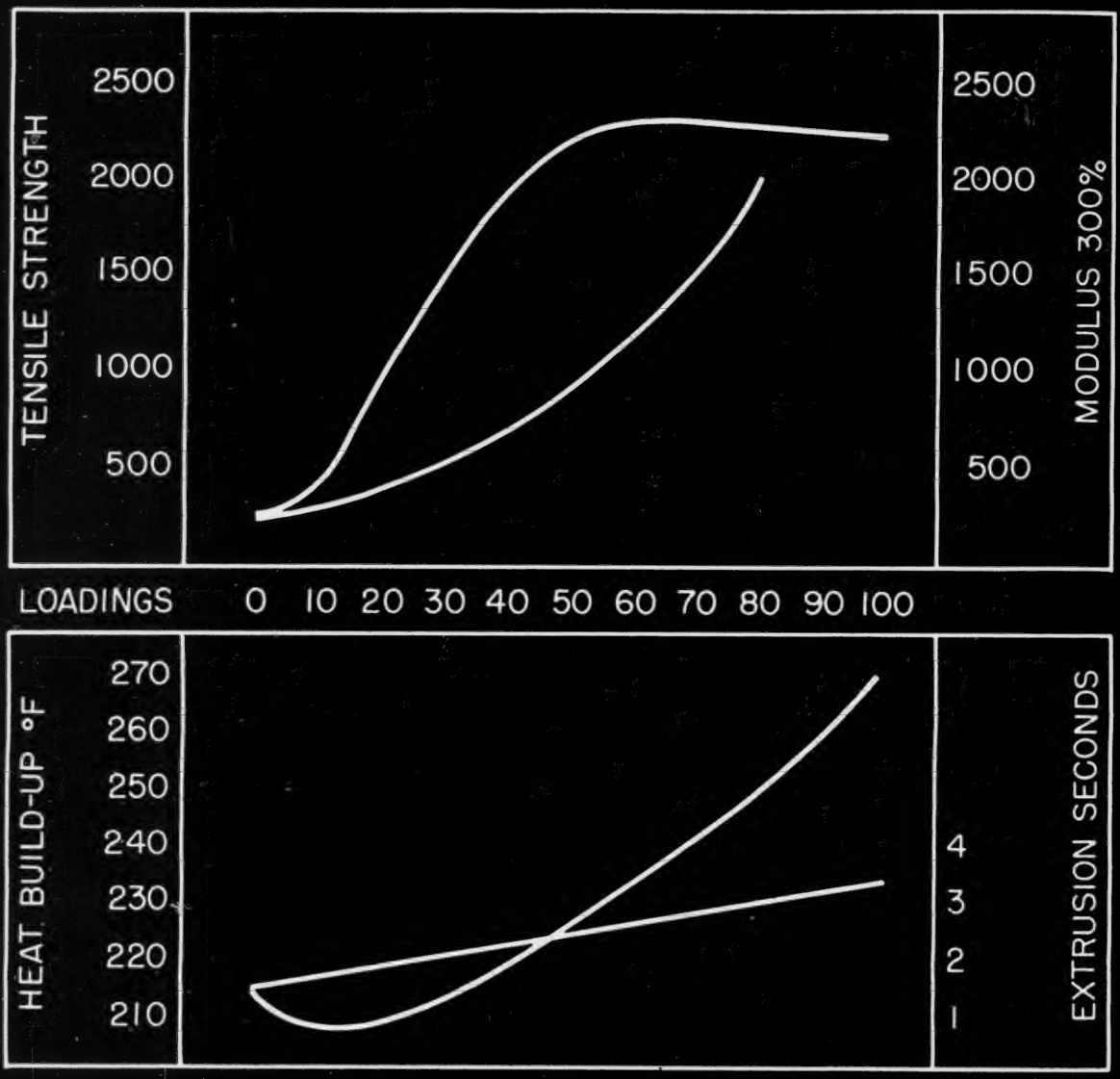
UNITED CARBON COMPANY, INC.

CHARLESTON 27, W. VA.

KOSMOS 40 · DIXIE 40

HMF TYPE

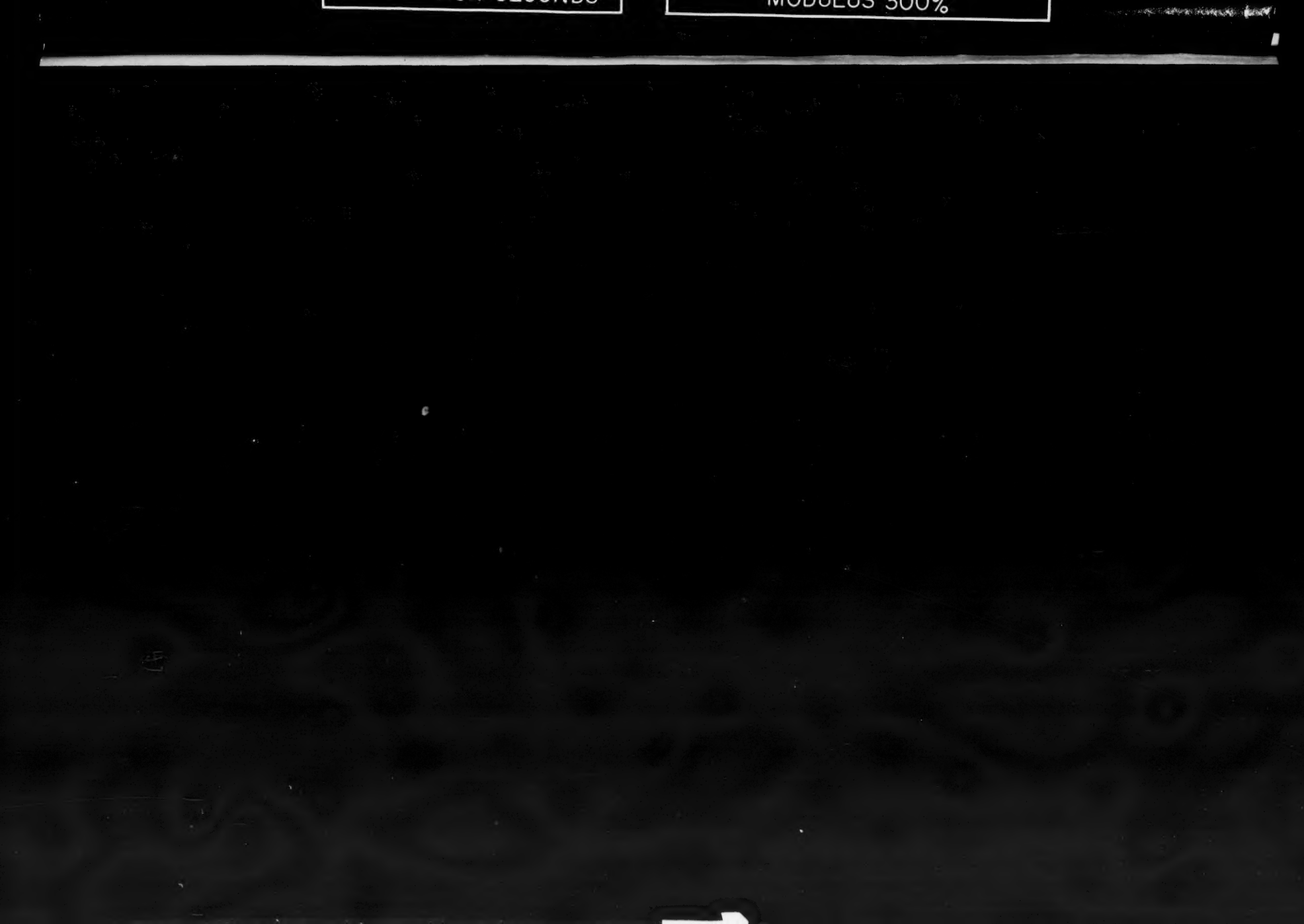
HIGH MODULUS FURNACE DUSTLESS BLACK



RESEARCH DIVISION

UNITED CARBON COMPANY, INC.

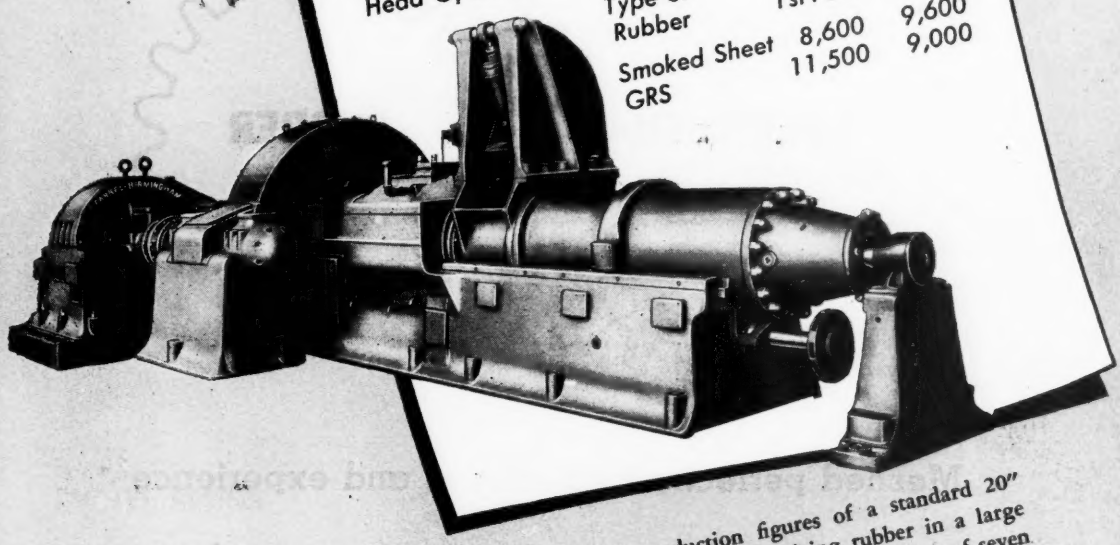
CHARLESTON 27, W. VA.


MODULES 300%

PRODUCTION REPORT: *Plasticizing*

Machine Size: 20" Gordon Plasticator
Head Opening: 5/16"

Type of Rubber	Pounds per Hour 1st Pass	2nd Pass
Smoked Sheet	8,600	9,600
GRS	11,500	9,000



These are the actual production figures of a standard 20" Gordon Plasticator breaking down or plasticizing rubber in a large tire plant. They show that this one machine will do the work of seven or more 84" mills, depending upon the degree of plasticity required. The consequent savings in labor, power and operating costs can be easily imagined.

For plants which do not require such a high rate of production, two smaller size Plasticators are available — the 15" with a capacity of 4400 to 5000 lbs. per hour, and the 12" that has an output of 2400 to 2700 lbs. Compared with the required number of roll mills for an equivalent output, both of these sizes will show savings in cost as well as improved plasticity. There is also a 3" size for laboratory use.

Farrel-Birmingham engineers will be glad to supply full information on any or all of these sizes. Write today . . . no obligation.

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.

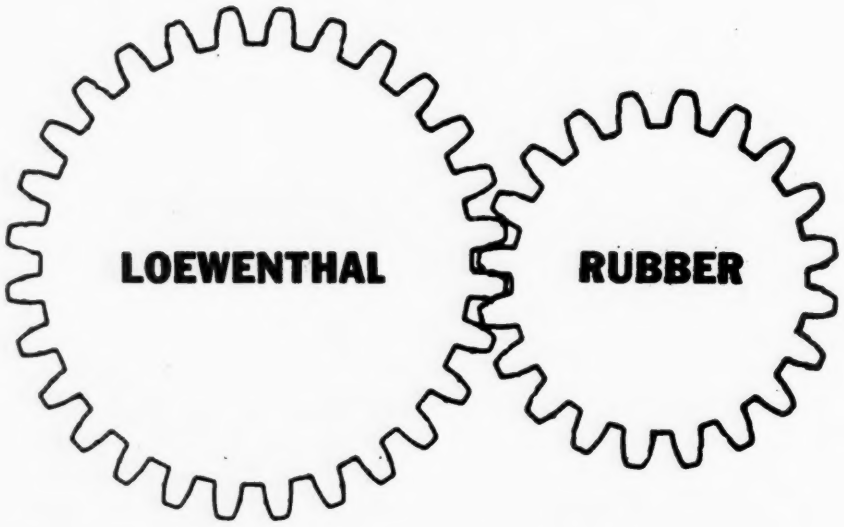
Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Los Angeles

F-B PRODUCTION UNITS

- Banbury Mixers
- Plasticators
- Pelletizers
- Mixing, Grinding, Warming and Sheeting Mills
- Bale Cutters
- Tubing Machines
- Refiners
- Crackers
- Washers
- Calenders
- Hose Machines
- Hydraulic Presses and other rubber working equipment.

Farrel-Birmingham

GEARED TOGETHER
SINCE 1868



Meshed perfectly by facilities and experience for constant and smooth operation, we have supplied properly-sorted scrap rubber to reclaimers, to their complete satisfaction, since the beginning of their business.

THE LOEWENTHAL CO.

JACK SIDER, *President* J. K. McELLIGOTT, *Exec. Vice-Pres.*

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AKRON 5, OHIO

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BAKER
PLASTICIZERS•

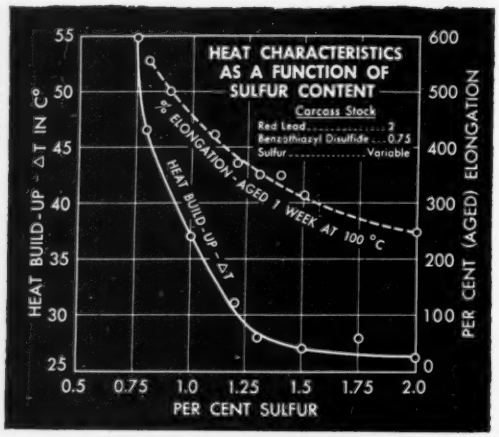
impart LOW TEMPERATURE *Flexibility*

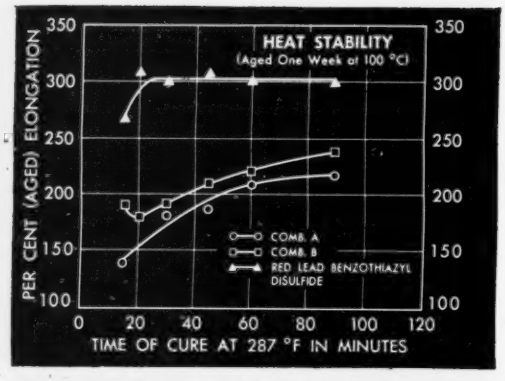
TO
CALENDERED COMPOUNDS

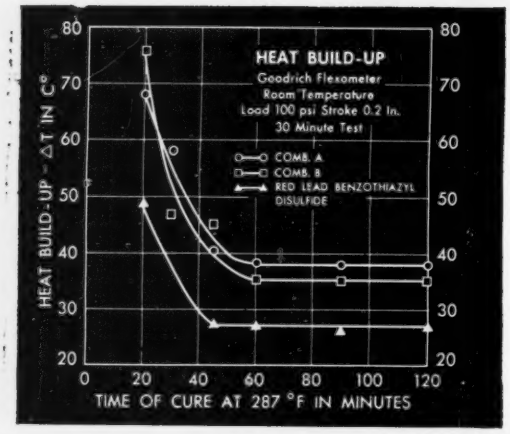
VINYL RESINS
CELLULOSE RESINS
BUNA-S BUNA-N
NEOPRENE

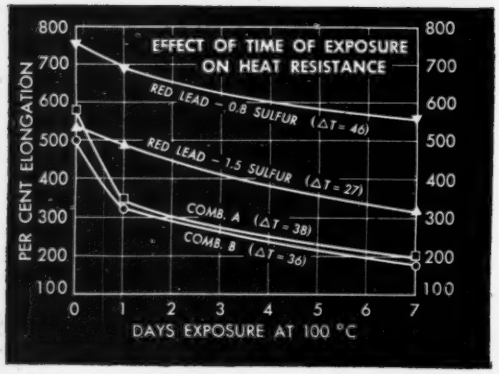
THE
BAKER CASTOR OIL COMPANY
ESTABLISHED 1857
120 BROADWAY, NEW YORK 5, NEW YORK
Chicago, Illinois Los Angeles, California

•CONTAIN NO PHTHALATE









Heat build-up and heat stability... both improve when you compound GR-S with RED LEAD

Have you had difficulty making your GR-S carcass stocks both heat resistant and cool running?

If so, try the right combination of red lead, benzothiazyl disulfide and sulfur.

Its acceleration is sufficiently active and efficient to provide—concurrently—heat stability and low heat build-up.

Note the following table and the accompanying charts.

FORMULA

GR-S (Institute)	100
S.R.F. Black	30
Zinc Oxide	3.0
Paraflux	7.5
No. 2 R.M. Red Lead	2.0
Benzothiazyl Disulfide	0.75
Sulfur	1.5

Physical Properties

T/287° F.	Tensile Strength	% Elong.	T-300	Shore	ΔT* in C°
15	1520	860	315	....	....
20	1630	780	390	46	49
30	1450	630	520	47	47
45	1330	530	570	47	27.5
60	1210	480	520	47	27
90	1130	500	590	47	26
120	1100	500	610	47	28

	Aged One Week at 100° C.			Aged 48 Hours at 100° C.	
T/287° F.	Tensile Strength	% Elong.	T-300	Shore	ΔT* in C°
15	910	270	.....	....	....
20	1080	320	1000	54	30.5
30	990	300	990	54	30.5
45	1050	310	1000	53	29.5
60	1130	300	1090	53	26
90	1090	300	1090	53	25
120	1160	340	1100	53	25

** Goodrich Flexometer operated at room temperature. 30 minute tests. Load 100 psi, stroke 20%.*

SUMMARY OF ADVANTAGES

1. Imparts improved heat resistance—retention of elasticity.
2. Imparts improved heat build-up—cooler running.
3. Relatively faster curing rate.
4. Safe processing.
5. Excellent general physical properties.
6. Broad curing plateau—very little change in properties on overcures.
7. Economical.
8. Available.



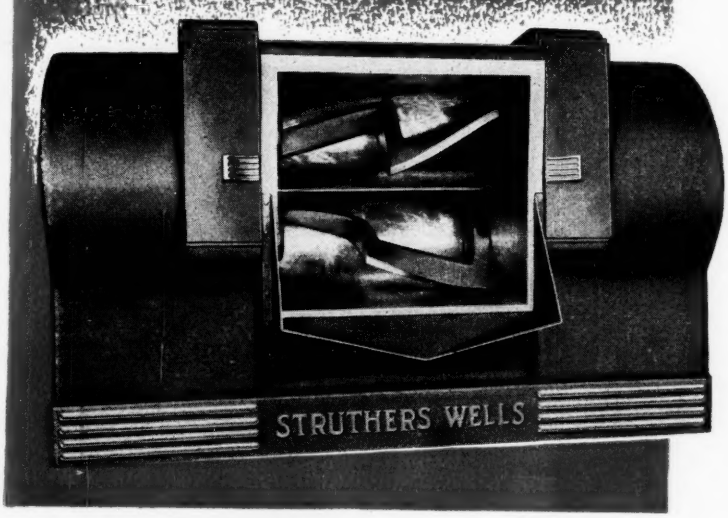
The charts illustrated are taken from a report on recent experimental work by the Rubber Division of our Research Laboratories on the problem of heat build-up and heat stability in GR-S stocks. Write for your copy. The report is titled, "The Heat Problem in GR-S Carcass Stocks."

NATIONAL LEAD COMPANY New York, Buffalo, Chicago, Cincinnati, Cleveland, St. Louis, San Francisco; Boston (National-Boston Lead Co.); Pittsburgh (National Lead & Oil Co. of Penna.); Philadelphia (John T. Lewis & Bros. Co.).

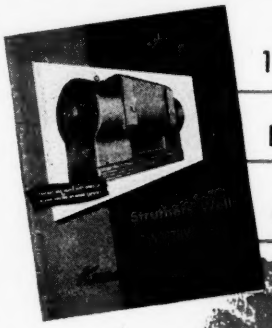
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Kneading Machines

Proven by Comparison . . . their ability to do a better job, more economically.



- ★ *Over 100 Sizes . . . from one pint to 3600 Gallons*
- ★ *Over 30 Different Types and Construction Arrangements*
- ★ *Horsepower Ratings to 1000 H. P. Input*
- ★ *Forward, Backward or Upside down Dumping*
- ★ *Heat-treated Alloy Steel Weldments*
- ★ *A product of more than 50 years' unexcelled experience in Fabricating, Forging and Machining.*



16 Page Technical Bulletin On Request

STRUTHERS WELLS CORPORATION
Northmaster Division, ERIE, PA.
Plants at TITUSVILLE, PA. and WARREN, PA.
Offices in Principal Cities

QUICK QUIZ:



Are you all at sea about these problems?

Maintaining conditions of air to control moisture regain in the cord or fabric?

Having the air in your plant conditioned to assure maximum efficiency and highest morale of your employees?

Controlling humidity of air to prevent cord from losing some of its adhesiveness?

Providing positive ventilation to minimize toxic fumes from processing operations?

Removing the weather variable?

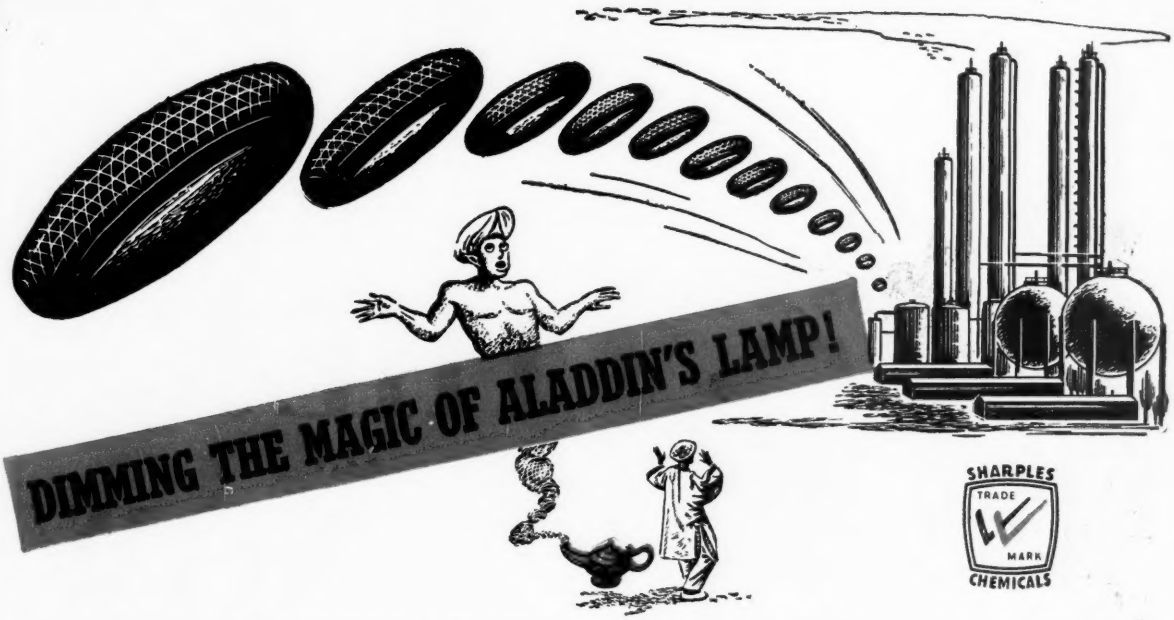
EASY ANSWER:

WHY NOT consult Carrier -- and benefit by the cooperation of specialists, thoroughly experienced in solving industry's particular problems in air conditioning, refrigeration and unit heating? Carrier's wartime achievements are being translated into remarkable new peacetime developments. Let the Carrier engineering staff tell you about them. Write today.

Carrier Corporation, Syracuse, N. Y.

Carrier

AIR CONDITIONING • REFRIGERATION
INDUSTRIAL HEATING



SHARPLES TRADE MARK CHEMICALS

The tremendous wartime expansion of the rubber industry has necessitated a parallel expansion in the production of rubber chemicals, and the development of new and varied types of rubber additives to meet the problems evolving from the compounding of the synthetic rubbers. These problems have not been solved by the magic of an Aladdin's Lamp, but by American research and ingenuity. Sharples has contributed to this program by greatly increasing its manufacturing facilities and by developing new compounding agents for the synthetic rubbers. Rubbing a magic lamp will not solve your compounding problems, but Sharples Rubber Chemicals may provide the solutions.

SHARPLES RUBBER CHEMICALS

VULCANIZING AGENTS	PLASTICIZERS	SOLVENTS FOR GR-S	BASIC CHEMICALS FOR RUBBER COMPOUNDING MATERIALS
VULTAC* NO. 1	Pentalenes †	Dichloropentanes	Ethylamines, Butylamines, Amylamines, Ethylethanolamines, Diethylaminoethanol, Butylethanolamines, Dibutylaminoethanol.
VULTAC* NO. 2	Dialkyl Acid Amides ‡	Mixed Amyl Chlorides	*Also other alkyl and alkylalkylolamines available in experimental quantities.*
VULTAC* NO. 3			

* Trade Name Registered. Chemically the VULTACS are alkylphenol sulfides.

† Trade Name Registered. Chemically the Pentalenes are Amyl Naphthalenes.

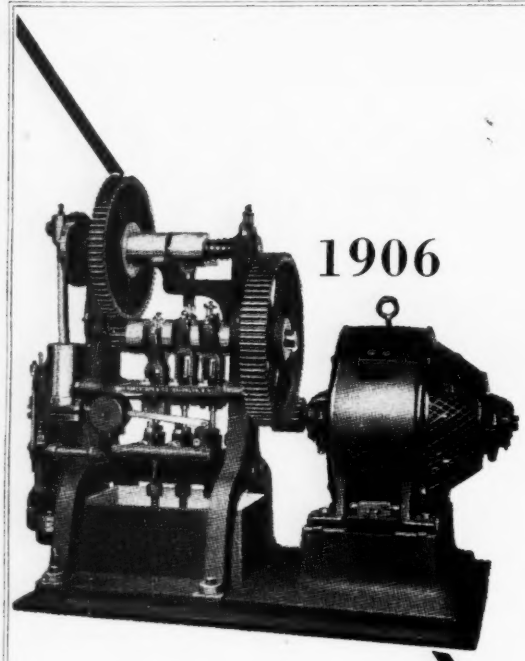
‡ Available in experimental quantities only.

Further information and samples will be sent promptly upon request.

SHARPLES CHEMICALS INC.

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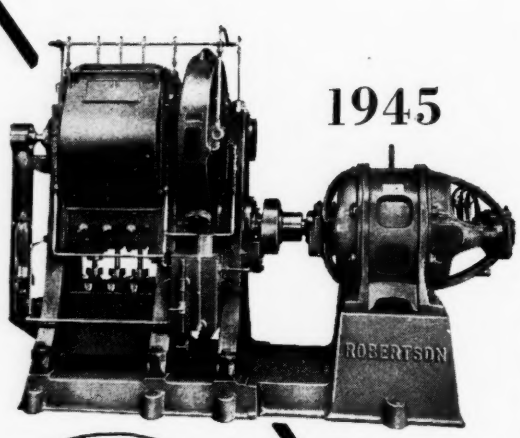


1906

THEN, as NOW

.... a Leader

To the modern eye, trained to the sleekness of streamlining and safety-design, the Robertson electrically-driven hydraulic pump above, seems a museum piece. But we at Robertson are as proud of it as we are of its modernized descendant, below. For in 1906, this hydraulic pump was outstanding in its field — embodying all the newest principles and the latest in engineering advancement known at that time. Too, we are justly proud of the 1945 model, for it illustrates clearly how Robertson research and awareness of all recent developments bring you "custom-built" equipment, endowed with the excellence of superior craftsmanship — *new* to the Nth degree.



1945

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COMPANY INCORPORATED
125-135 WATER STREET, BROOKLYN 1, NEW YORK
Designers and Builders of all Types of Lead Encasing Machinery
Since 1858

If you would like to be among those receiving "Robertson Reminders," our occasionally-issued house-organ, write to us on your business stationery, and we shall be glad to send you a copy, without obligation, of course.

An old story with a new twist



In the rayon industry, famed for its many new developments, tire cord made of rayon yarn is now an old story but Industrial gives it a new twist–an UP-twist.

Thanks to the exclusive properties of "Continuous Process", Industrial's Tyron Yarn is delivered, fully stretched and processed, on bobbins instead of the large beams used in conventional methods.

Hence, Tyron may be UP-twisted, dispensing with the rings, travellers, and greasing of the down-twist process. Our way, the yarn travels only a few feet, receives a uniform twist under less tension, is cleaner, subject to less surface abrasion, and is wound onto large knot-free packages that require no separate spooling operation.

UP-twisting is a typical example of many contributions of the "Continuous Process" to greater rayon-making efficiency, and a commentary on the skill and resourcefulness Industrial is devoting to chemical, mechanical and textile phases of rayon production.

it's a new twist in UP-twisting Remember it!

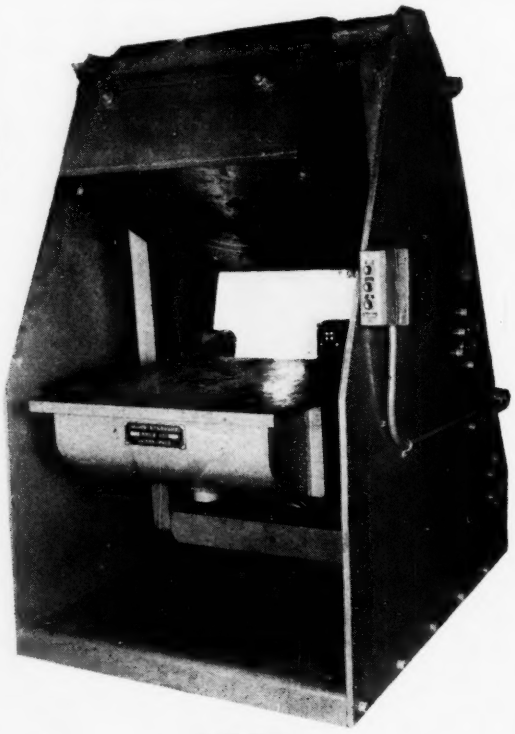


Industrial RAYON CORPORATION
CLEVELAND, OHIO
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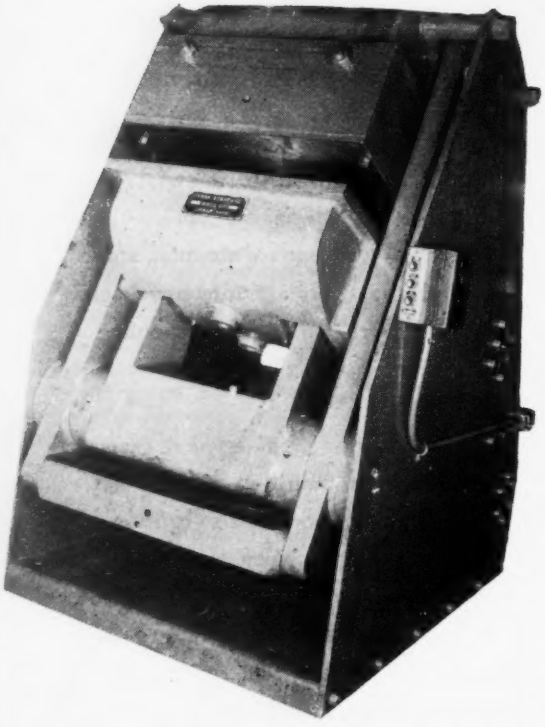
MAKERS OF *Spun-lo RAYON YARN AND CLOTH and *TYRON YARN, CORD AND FABRIC

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STANMOCO
OIL HYDRAULIC
VULCANIZING
PRESS



OPEN



CLOSED

For mechanical rubber and plastic articles. Combination oil hydraulic and toggles with platen pressure of 200 tons. Platens 34″ x 34″ with daylight opening 14½″. May be adjusted for slight variation of mold thickness. A stripper can be provided which operates when the press is opening. Closing time of press can be made adjustable, if so desired. Simple in construction and easy to lubricate and maintain. Cycle control is very simple and all that is necessary is to connect 110 volts to Terminal Box. Push button station has a close, open, and jog button for manual or automatic operation. Of fabricated steel with Meehanite cylinder.

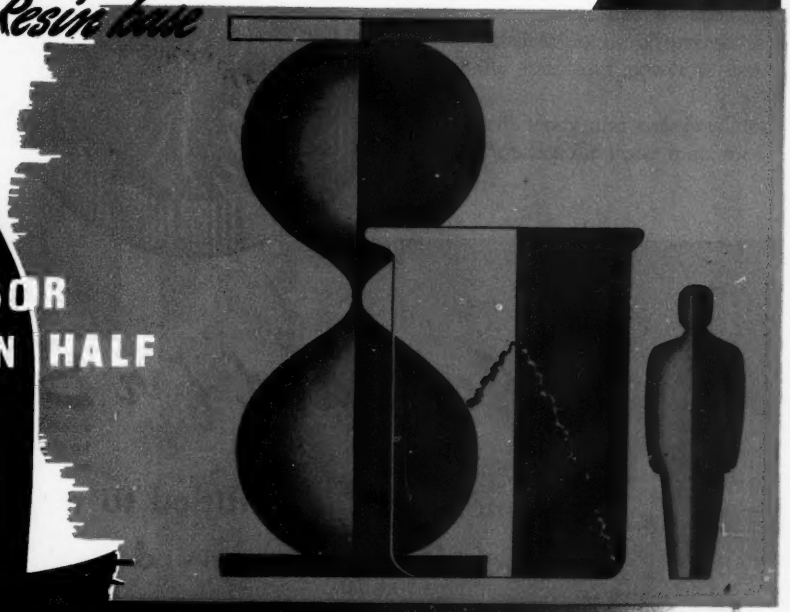
Write for complete details

The Akron Standard Mold Co.

Akron — "The Established Measure of Value" — Ohio

FUZON-O

The New Waterproof Coating with "VINYLITE" Resin base*



CUTS TIME, LABOR & MATERIALS IN HALF

Coatings based on "Vinylite" resin LOOK different . . . ACT different . . . ARE different. FUZON-O, the amazing new "Vinylite" resin base formulation, resists oil, grease, alkali and acid . . . withstands oxidation . . . is exceptionally immune to moisture, abrasion and temperature. Use FUZON-O on cotton, nylon, glass fabrics . . . and many other materials. Learn more about FUZON-O. Write for booklet to the Stanley Chemical Company . . . manufacturers of Stanley Lacquers, Enamels, Synthetics and Japans . . . East Berlin, Connecticut.

*Trade Mark Carbide and Carbon Chemicals Corporation

Stanley Chemical



Awarded for Service

The men who are entitled to wear this button on their lapels have served their country well, and have been honorably returned to civilian pursuits. Let us not forget their faithful service.

Acknowledgment of service is also due the rubber reclaiming industry which has cooperated heartily to carry out the country's rubber program, and kept the war rolling on rubber.

PEQUANOC RUBBER CO.

QUALITY RECLAIMS FOR SPECIFIC PURPOSES

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1162 PARK SQUARE BLDG.,
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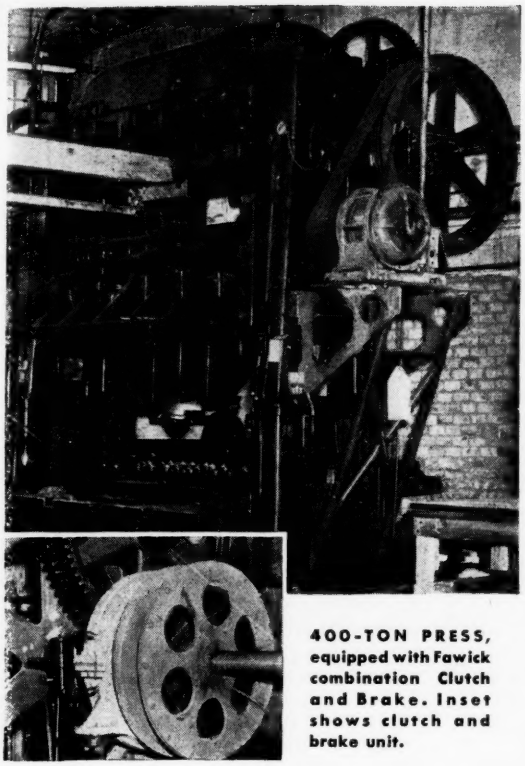
European
BURNETT & CO. (London) Ltd.
46 HERGA COURT
HARROW-ON-HILL, MIDDLESEX, ENGLAND

FAWICK CLUTCHES
IN HEAVY-DUTY DRIVES

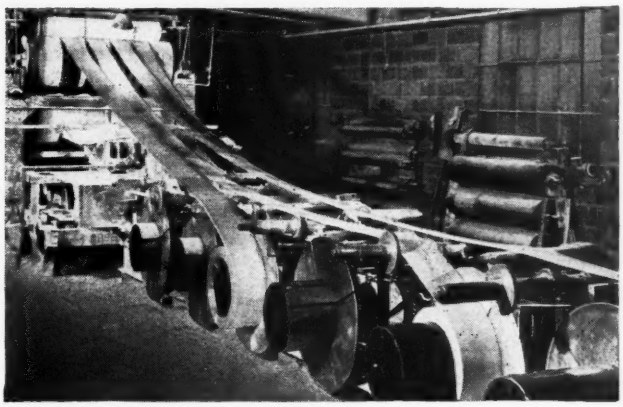
Machines that make quick starts and stops—under stress and shock—are proving the value of the Fawick Clutch.

This new clutch transmits power and absorbs torque through a cushion of rubber and air. It has no springs, arms or toggles, requires no lubrication or adjustments. Maintenance costs are unusually low, and power is controlled within close limits.

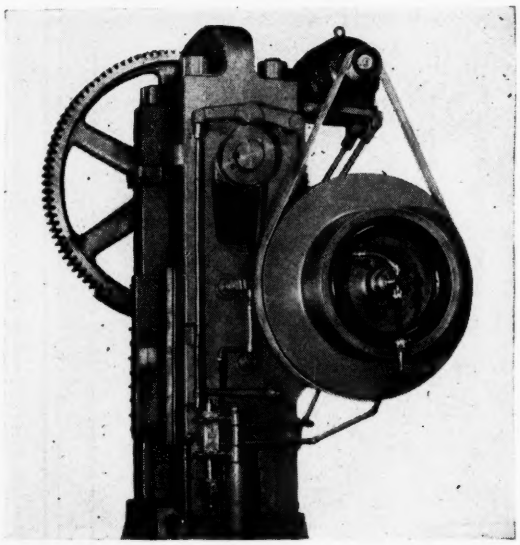
If you want this new clutch efficiency and economy, let us help you *engineer* Fawick Clutches for *your* machines. Book on request.



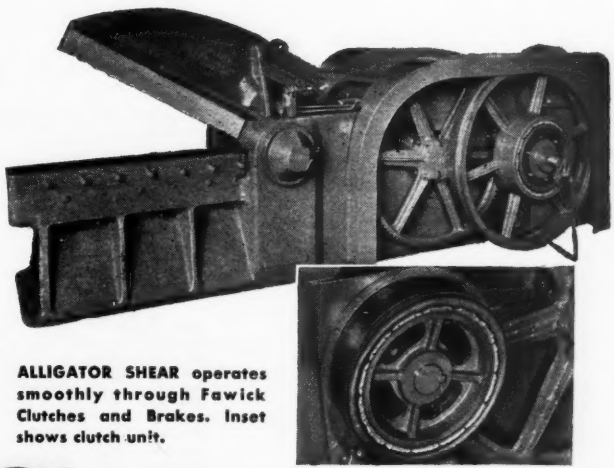
400-TON PRESS, equipped with Fawick combination Clutch and Brake. Inset shows clutch and brake unit.



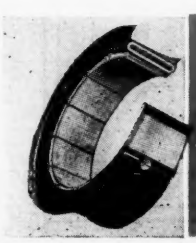
STEEL ROLLING MILL equipment finds Fawick Clutches effective and economical, and suited to rigid product control.



POWER PRESS, Fawick-equipped, has smooth starts and stops. "Inching" provided for without special equipment. Maintenance costs low.



ALLIGATOR SHEAR operates smoothly through Fawick Clutches and Brakes. Inset shows clutch unit.



FAWICK *Airflex* CLUTCH

FAWICK AIRFLEX CO., INC. • 9919 Clinton Road, Cleveland 11, Ohio

In Canada, Reynold-Coventry Ltd., Montreal, Toronto, Vancouver • In Britain, Crofts Engineers, Ltd., Bradford, England

A promise that can be taken for granted

The end of the war means the end of an unparalleled military effort by the American people. Their profound sense of relief at the removal of a burden of unequalled magnitude in history will now find release in a desire for the many material comforts which, of necessity, was denied to all during the war.

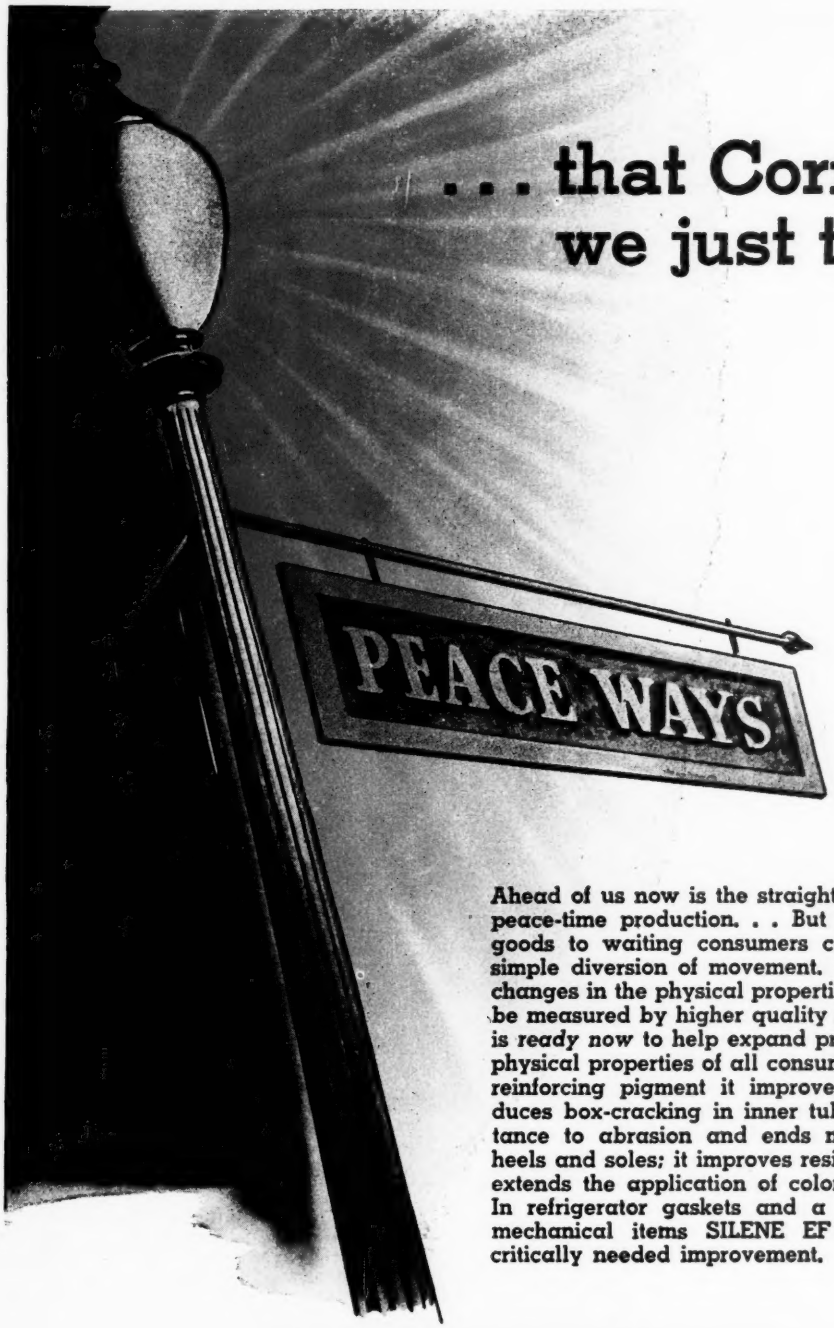
The rubber, paint and other industries consuming zinc oxides are now confronted with an enormous pent-up demand for their respective products. But, as usual, these industries—always distinguished for their enterprise—will "come through" for the consumer. And, with equal certainty, the St. Joseph Lead Company will, as usual, be ready to supply its customers with the pigments they have always preferred—ST. JOE Lead—Free ZINC OXIDES.

ST. JOSEPH LEAD COMPANY

250 PARK AVE., NEW YORK 17, N. Y.



MADE BY THE LARGEST PRODUCER OF LEAD IN THE UNITED STATES



. . . that Corner we just turned

Ahead of us now is the straightaway. It leads to full peace-time production. . . But speeding the flow of goods to waiting consumers calls for more than a simple diversion of movement. It necessitates critical changes in the physical properties of goods which will be measured by higher quality standards. SILENE EF is *ready now* to help expand production and improve physical properties of all consumer goods. As a white reinforcing pigment it improves elongation and reduces box-cracking in inner tubes; it increases resistance to abrasion and ends marking tendencies in heels and soles; it improves resistance to hot-tear and extends the application of color to drug sundries. . . In refrigerator gaskets and a wide range of other mechanical items SILENE EF brings definite and critically needed improvement.

SILENE EF

STANDARD *Chemical Company*

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When you buy bearings look for the trade-mark "TIMKEN". This famous trade-mark means the last word in quality, design and materials—the utmost in bearing performance—in short, all there is in bearings.

The Timken Roller Bearing Company, Canton 6, Ohio, U. S. A.

Timken Bearings, Timken Alloy Steels and Tubing and Timken Removable Rock Bits.

COPYRIGHT 1945 THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO



The smart white rubber commodities of pre-war days really have been missed. An eager market awaits their return.

And the extreme whiteness and brightness contributed to natural rubber products by titanium pigments are well worth the waiting. The effectiveness of these pigments, which are most widely known under the name of TITANOX, is unrivaled.

High tinting strength, fine particle size and reinforcing qualities are characteristics of TITANOX pigments which have earned them top rating in white rubber compounding.

TITANOX pigments will help you to meet future high standards of whiteness and brightness in rubber compounds.

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SOLE SALES AGENT
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TITANOX
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Announcement

TO THE

AUTOMOBILE INDUSTRY

WE ARE READY

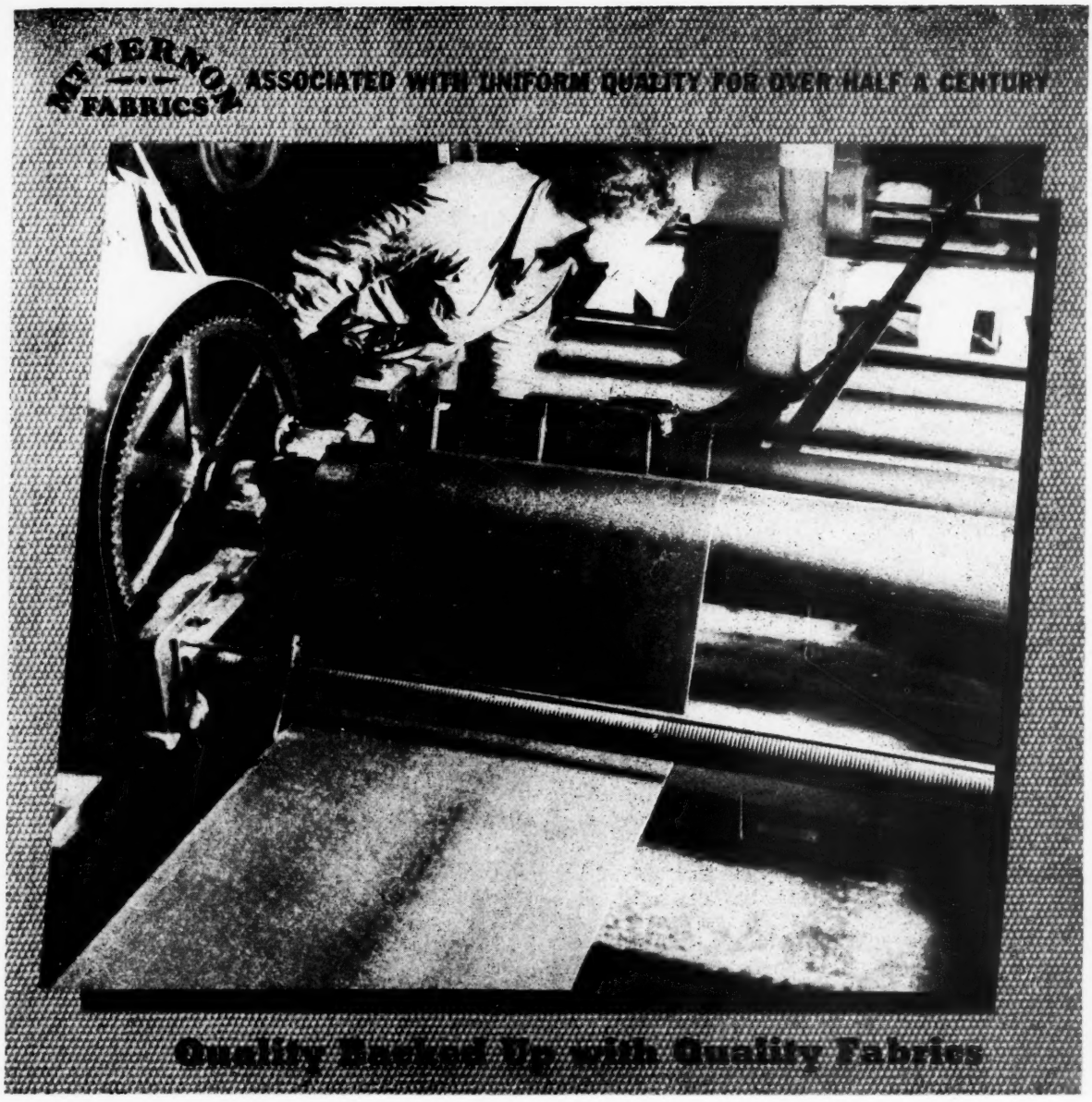
with a complete line of synthetic rubber latex adhesives, coatings and saturants, compounded to meet your specific requirements.

General Latex & Chemical Corp.

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Vultex Division—Verdun Industrial Buildings
River Street, Verdun, Montreal, Quebec

Agents for Rubber Reserve Company for storage and distribution of natural rubber latex. Distributors for Rubber Reserve Company for synthetic latex. Operators of the Government-owned Baytown, Texas, synthetic rubber plant in collaboration with the General Tire & Rubber Co.



Rubber products backed with MT. VERNON fabrics get their first assurance of quality in MT. VERNON's laboratories. For that's where every step in the production of these top quality cotton fabrics is guided and directed — to insure the uniform weave that means more uniform rubber products whenever you specify MT. VERNON fabrics.

MT. VERNON WOODBERRY MILLS, INC.

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SYNTHETIC LATEX COMPOUNDS

for

COMBINING
LAMINATING
FOLDING
IMPREGNATION
COATING
GENERAL
ASSEMBLY WORK

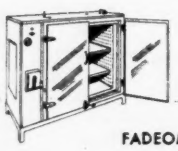


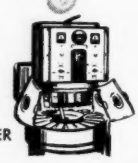
- √ ageing
- √ mileage
- √ drying time
- √ flexibility
- √ film strength

- √ Buna
- √ Neoprene
- √ Other Synthetic Bases

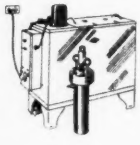
The UBS Laboratories are only one of many American industrial research groups busy with synthetic latex compounding problems. But we *have* made some valuable contributions to the general fund of knowledge in this important field, *including the development of several original bases.* And we're constantly conducting tests to improve ageing qualities for particular applications, *employing the testing methods best suited to the application for which the compound is to be used.* For experience has taught us that no single Testing Method is valid for all synthetic latex applications. The Oxygen Bomb will often show things, for instance, that a Fadeometer can not possibly show. That's why we keep all three Testing Methods in operation at the UBS Laboratories—*Geer Oven, Oxygen Bomb and Fadeometer.* And that's one more reason why we think you will find UBS a good source of supply for Synthetic Latex Compounds. *Write today, describing your problem in detail.*

GEER OVEN





FADEOMETER



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Background FOR A FIRST LINE SERVICE IN CARBON BLACK



Typical of Continental's modern, large scale facilities is this new channel black plant at Sunray, Texas.



Up-to-the-minute methods and equipment, such as these gas distributing and black collecting systems, are in use at Continental's plants.

As a result of its policy of looking ahead and anticipating the needs of the rubber industry for carbon black, Continental Carbon Company is in a position to give a complete and highly advanced service in this vital material.

Continental has recently completed and put into operation a large DPC channel black plant, and a furnace type black plant especially designed for the production of Continental SRF Both of these new plants are equipped with the latest and finest facilities available and are backed by the cooperation and technical assistance of the Witco research laboratories.

Whether you need channel or furnace type black, for use in either natural or synthetic rubber formulations, look to Continental for *complete* service.

HAVE YOU OBTAINED YOUR COPY OF THE NEW WITCO CARBON BLACK MANUAL?
This comprehensive, up-to-date compilation of facts on the properties and applications of channel and furnace blacks produced by Continental and Witco will be sent on request.



CONTINENTAL CARBON COMPANY

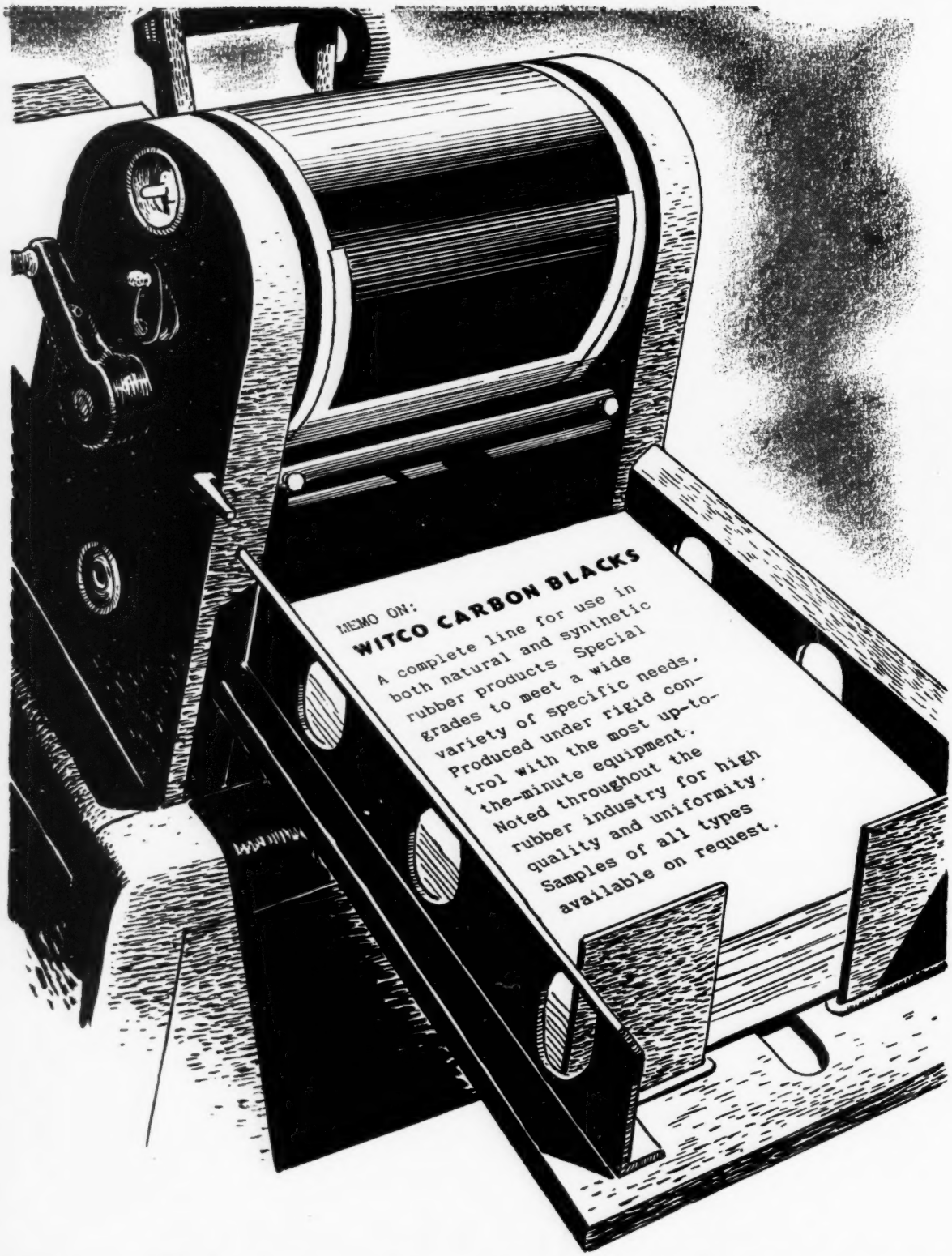
MANUFACTURER
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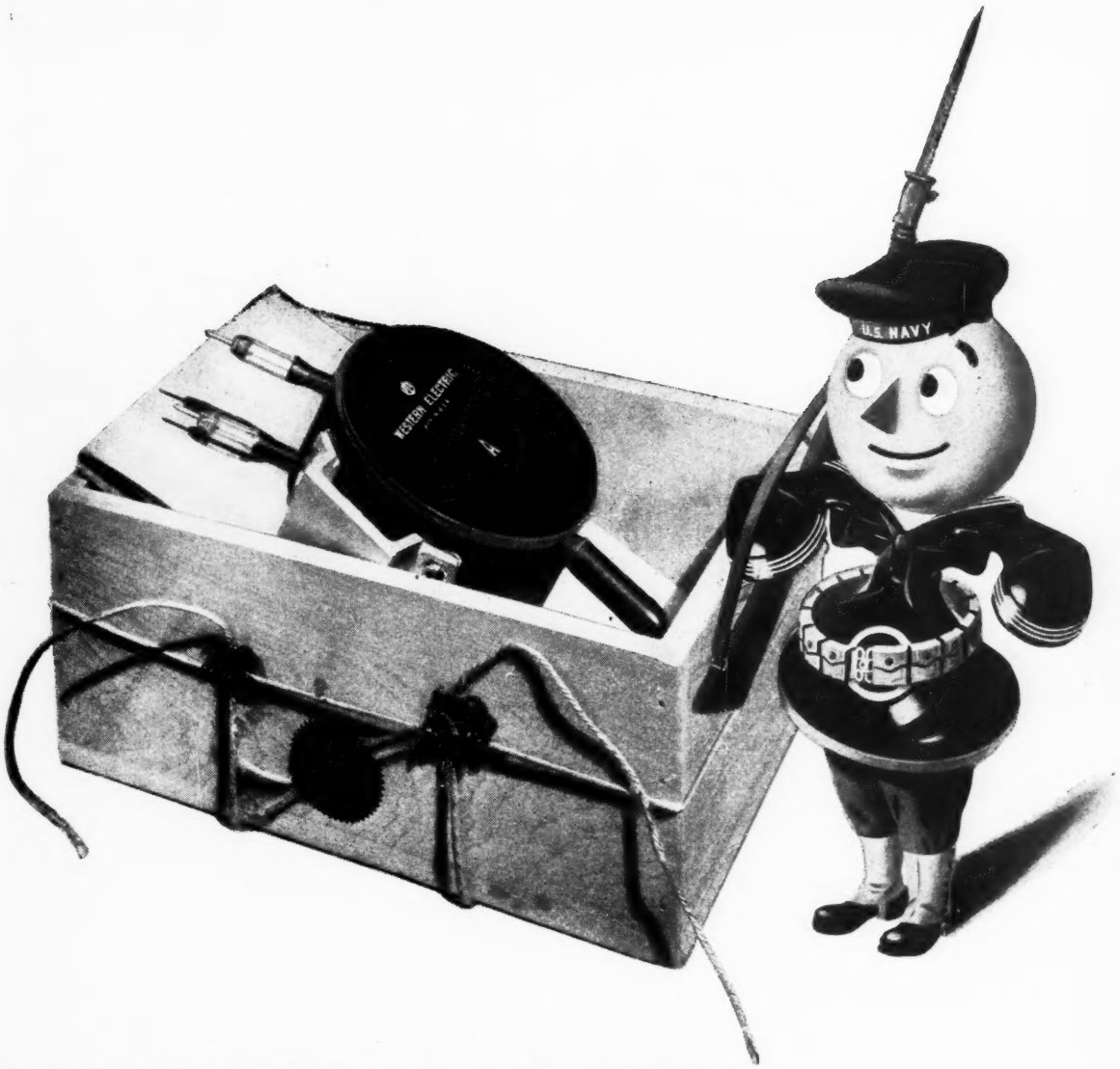


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VICTORY REVEALS A MYSTERY

More than two years ago, an engineer of the Laboratories visited *U.S.S. Boise*, returned with a mysterious box which went into the Laboratories' vault. Now, victory opens the box and discloses a special kind of electron tube called a magnetron. It was part of a Radar which furnished data to aim *U.S.S. Boise's* guns during the night action off Savo Island on October 11-12, 1942. Because of the high frequency generated by this magnetron, the Radar was not detected by the enemy and the action was a complete surprise. Six Japanese warships were sent to the bottom of the sea.

This magnetron is a symbol of the Laboratories' enormous war program. Half of it was devoted to Radar, the other half gave birth to radio transmitters and receivers, sonar apparatus for the Navy, loudspeaker systems for ships and beach-heads, fire-control apparatus for anti-aircraft artillery. Coming months will unfold the story of these and many other contributions of the Laboratories to the victory of our arms.

Bell Telephone Laboratories' war work began before the war; until now, it claimed practically all our attention. With victory, we will go back to our regular job—helping to bring you the world's finest telephone service.

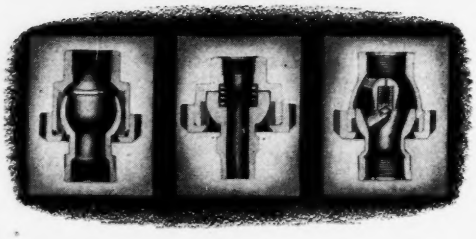
BELL TELEPHONE LABORATORIES

Exploring and inventing, devising and perfecting, for continued improvements and economies in telephone service.

Nature provides flexibility in every living thing



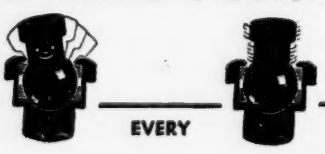
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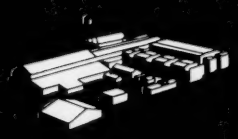


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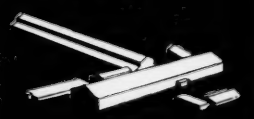
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MAINTENANCE PROBLEMS

IN ARMY proving ground tests, rayon-cord tires gave striking evidence of their ability to stand wartime duties. An important part of this evidence pointed out that rayon-cord synthetic-rubber tires were 330% better on long-distance supply work.

In another Army test where rough cross-country terrain exposed them to severe bruising and cutting conditions, they proved to be 93% better. While not made under normal road conditions, the tests indicate that reduced maintenance troubles may be expected from tires constructed with rayon-cord.

The scientific reason for this is that rayon's molecular structure and physical uniformity provide better heat dissipation, allowing a tire of the same thickness to run cooler by as much as 10°F. Also, rayon retains its tensile strength better at high running temperatures.

You benefit from fewer blowouts, bruises, cuts, abrasions, and sidewall breaks . . . principal tire maintenance problems. Important added benefits are longer tire life, lower operating costs, fewer delays, better mileage and greater safety on the road.

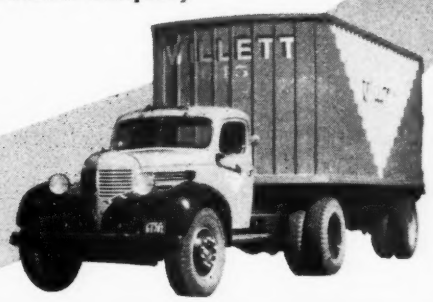
Source of data: Hearings before a Special Committee Investigating the National Defense Program, United States Senate—Seventy-eighth Congress, First and Second Sessions.

Less with Rayon Cord

"RAYON CORD TIRES REDUCE BLOWOUTS; TAKE OVERLOADS BETTER."—

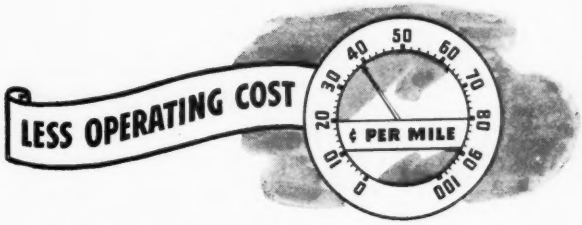
Howard L. Willett, Jr., *Vice President, The Willett Company*

The Willett Company of Chicago, middle-western operators of a fleet of 1,000 trucks, tractors and trailers, and 100 suburban buses, have used rayon cord tires since 1938. Howard L. Willett, Jr., vice president, declares: "We have used rayon cord tires for the last seven years, even when we had to pay a premium on the first cost. Our records show that they are more economical in the long run. Due to cooler running, they take overloads better, reduce blow-outs, road service and other maintenance. We get better results on rayon cord tires no matter where we use them."





Less friction heat, higher tensile strength and greater uniformity of rayon tire cords mean more safety at high running speeds.



Rayon-cord tires give longer life, greater mileage . . . reduce impact failures, road delays, tire renewals.

AMERICAN VISCOSE CORPORATION

America's largest producer of rayon tire cord, yarn and staple fiber

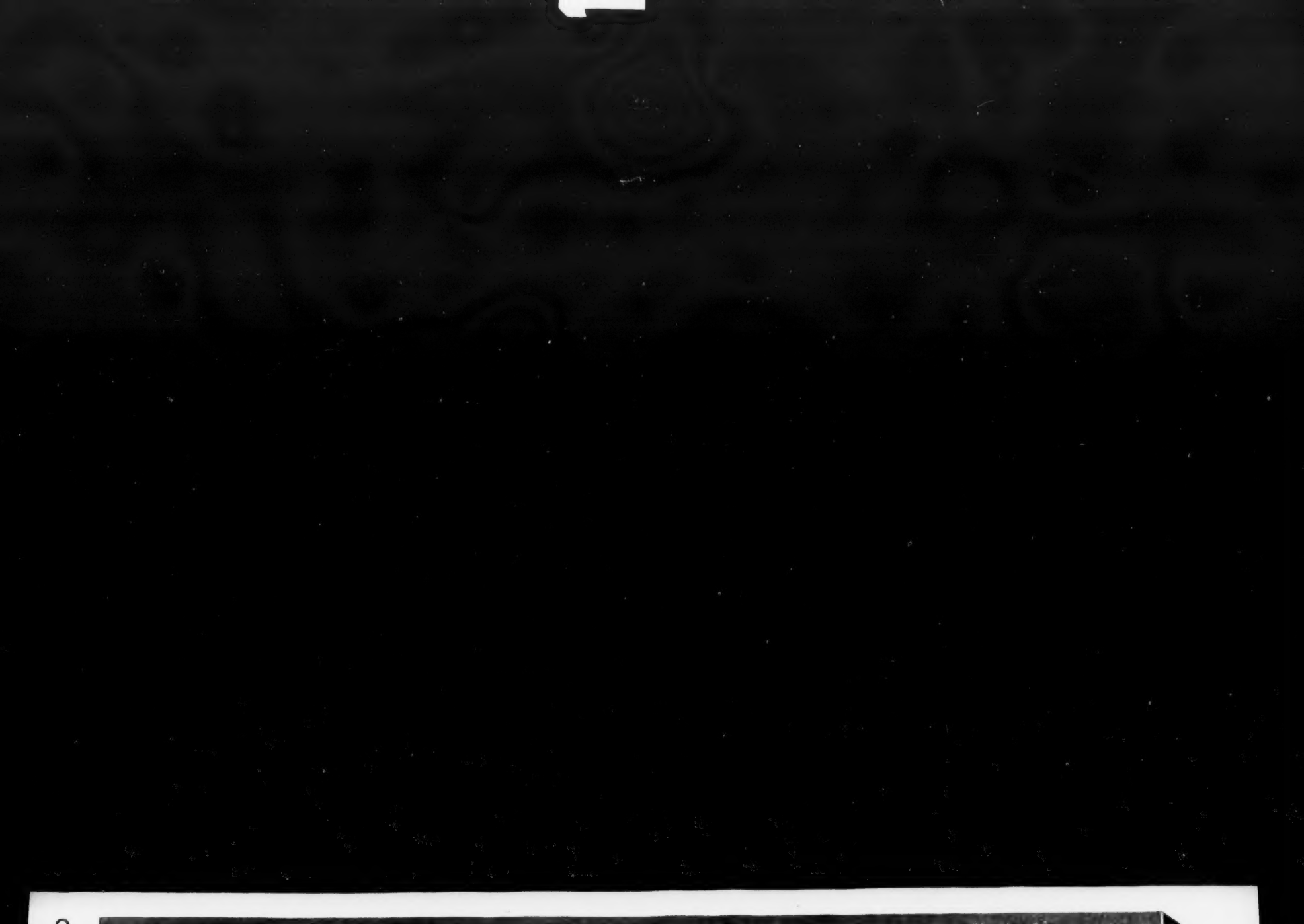
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A Westinghouse Air-Cooled Transformer was subjected to special and abnormally severe moisture and temperature tests for 2000 hours. After 16 hours of heavy loading, the transformer was de-energized and a spray of water was directed on the windings for five minutes. The transformer remained de-energized for eight hours. This test was repeated each day. The standard dielectric test was applied weekly. No failure of any kind resulted.

Today's requirements for safe and reliable indoor transformers all point to dry, air-cooled equipment.

The proof is in the growing preference for Westinghouse Air-Cooled Transformers and Power Centers, for service in all types of plants, from subarctic climates to the tropics.

Here are the reasons. Because air cooling does away with the fire and explosive hazards of liquids, it is **SAFER**. Freedom from liquid seepages and sludge makes it **CLEANER**. As air-cooled transformers need no vaults or catch basins, they are **EASIER TO INSTALL**. Because there's no time out required for liquid reconditioning or refilling, they are **EASIER TO MAINTAIN**.

Get the latest facts on **AIR-COOLED** design. Write for booklet B-3459, "Air Cooling". Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania.

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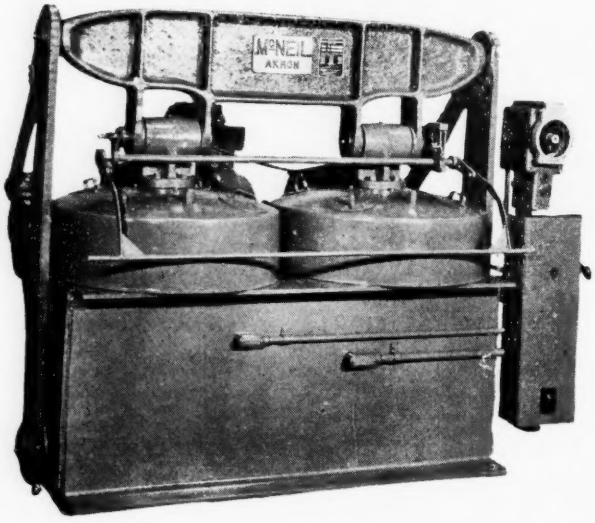
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CALDWELL COMPANY
2412 FIRST CENTRAL TOWER
AKRON 8, OHIO

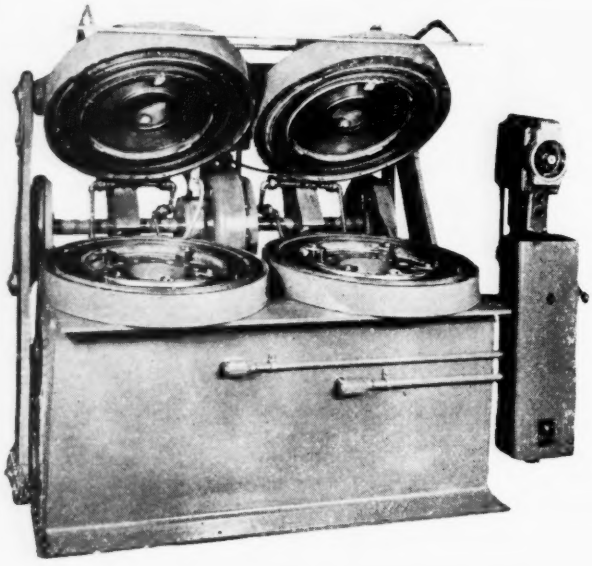
McNEIL—AKRON

Twin Bike-Tire Curing Press

McNeil is now making deliveries of a strictly modern electrically operated twin press for the curing of bicycle tires. It is suitable for either the old style single tube or the more modern straight side type of tire.

This press is good for 40,000 lbs. in each mold position and is 68" wide between the side arms. It is furnished complete with drilled steel steam platens for the use of ordinary two or three piece molds. The upper platen is easily and quickly adjustable to suit mold thickness.





Insulating shields which surround the entire mold and platen unit are a standard part of the press. In addition to being good insulators they add a streamlined appearance to the completed unit.

The press is furnished with the latest design of McNeil timer for automatic control, together with all other necessary electrical equipment, including safety bar.

The press closes in approximately three seconds and automatically inflates the curing bag the instant the two mold halves are together.

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This unit is the latest addition to the complete McNeil line of curing equipment.

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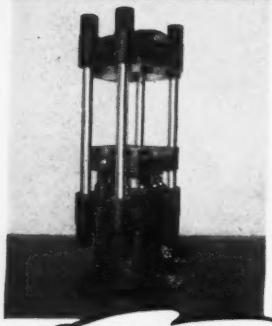
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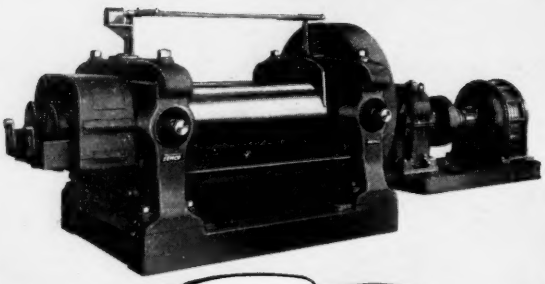
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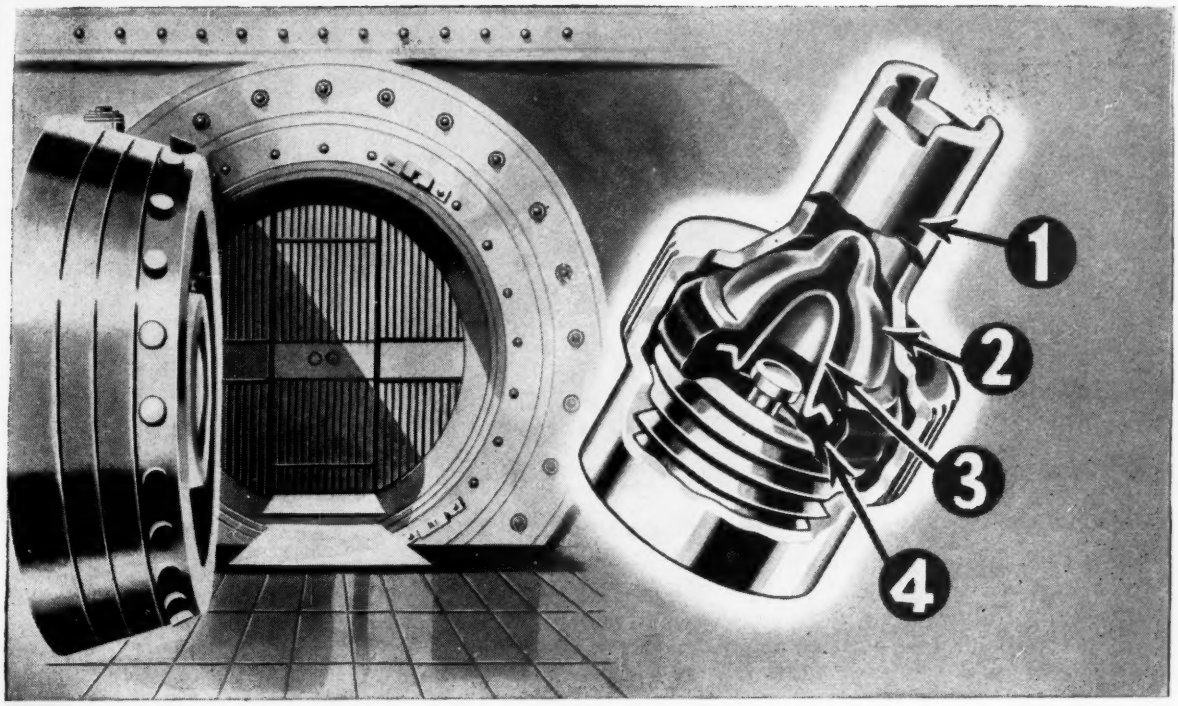
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Nationally advertised to "Make your tires last longer." See that every one of your customers has this protection—a Schrader air-tight Cap on every tire valve mouth.

It will help them—it will help you.

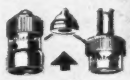
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Among the problems that must be solved by processors of synthetic rubbers is the masking of disagreeable odors, which in some cases are so strong as to require special knowledge to overcome.

Givaudan has attacked this problem with highly successful results. Our special PARADORS, developed for use in synthetic elastomers, including Neoprene Latex, not only provide prompt relief at the points where it is needed but assure freedom from disagreeable odors in the finished products themselves. These PARADORS, available in a wide variety to meet practically all deodorant and reodorant needs, cover not only the odors of synthetic rubbers but the odors of other ingredients used in special products such as adhesives and molded items. They are the result of long research and specialized experience in aromatics for all purposes. Givaudan is the leader in this field. Let our staff help you solve your odor problems now—and show you how you can give your future products the appeal of odor-free quality.

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The development of water dispersed rubber opened new fields, bringing rubber's advantages to many industries . . . new uses for rubber were made feasible . . . old uses made more economical, more practical, fire-safe. Today, aqueous dispersed rubber is consumed in large quantities by industries other than rubber manufacturers . . . some representative uses are:

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Automotive carpet backing

Carpet non-skid backing and flexible backsizing

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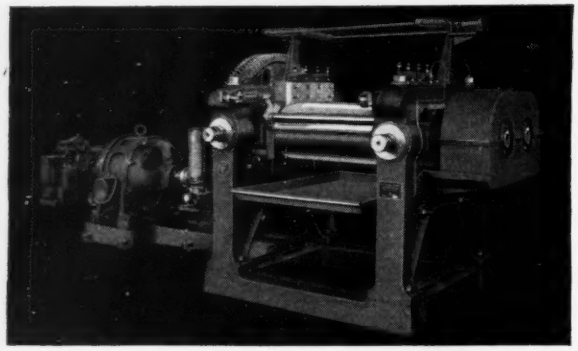
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Technical Bulletin No. 15 — on the Compounding of GR-S with Substantial Loadings of Zinc Oxide

Effect of Moisture on Zinc Oxide—GR-S Compounds

(Refer to Technical Bulletin No. 12)

ORIGINAL RESULTS

Time of Cure Min. at 45 Lb.	Tensile Strength (psi)	Per Cent Elongation	Modulus-Load (psi) for Elongation of: 200%	300%	400%	500%	Shore Hardness	Permanent Set
NO WATER—XX RED-4								
15	1240	1005	80	115	155	195	45	.42
30	1230	780	155	190	230	345	47	.30
45	1115	685	155	190	270	425	48	.25
60	1165	660	155	235	310	465	48	.26
90	1040	630	190	230	345	540	49	.24
120	1050	630	195	235	350	545	49	.24
NO WATER—XX RED-166								
15	1205	1060	115	150	190	225	44	.48
30	1600	880	150	190	230	340	45	.36
45	1530	780	155	235	275	430	47	.34
60	1320	710	195	235	350	465	49	.29
90	1410	680	235	275	350	550	49	.29
120	1115	630	230	270	385	575	49	.23
5% WATER ON THE POLYMER—XX RED-4								
15	1370	735	185	260	335	480	53	.59
30	1280	640	235	310	425	700	53	.53
45	1450	630	230	340	495	840	52	.56
60	1470	610	225	300	490	830	52	.47
90	1640	620	230	340	535	915	53	.49
120	1115	540	270	385	575	960	53	.36
5% WATER ON THE POLYMER—XX RED-166								
15	1440	730	215	290	395	540	53	.62
30	1500	660	225	335	525	785	53	.50
45	1560	630	265	380	570	915	53	.60
60	1630	635	270	350	545	890	53	.57
90	1610	620	300	410	600	975	53	.54
120	1550	590	300	415	605	1020	53	.44

	Time of Cure Min. at 45 Lb.	Shore Hardness Pendulum Block	Goodyear-Healey Pendulum: Indentation in mm.	Goodyear-Healey Pendulum: Per Cent Rebound	Compression Fatigue (Goodrich Flexometer)*: Per Cent Initial Comp.	Running Time and Per Cent Permanent Set	Max. Temp. Rise °C.	Dynamic Compression: Initial	Dynamic Compression: Final	Cut-Growth Resistance: Tested at 70°C. Inches Failure 2,000 Cyc.
XX Red-4										
No Water	90	48	7.73	57.4	22.2	†B.O.-10′	69.6	8.7	24.6	.69
5% Water	90	50	7.43	58.6	20.3	15′-24.3	75.5	6.4	24.2	.31
XX Red-166										
No Water	90	48	7.73	56.6	21.8	20′-31.1	94.6	8.7	31.3	.40
5% Water	90	52	7.20	58.3	18.0	10′-16.0	57.7	3.8	16.3	.21

* Test Conditions: 93 psi load. 0.25″ stroke. 100° C. oven temp. †Blew Out.

NOTE: Goodrich Flexometer test conditions have been made more severe for stocks of 50 Shore "A" Durometer or under. This should be taken into consideration when making comparisons with previous work where the operating conditions were: 100 lb. load, 0.15″ stroke, 100° C. Oven Temp.

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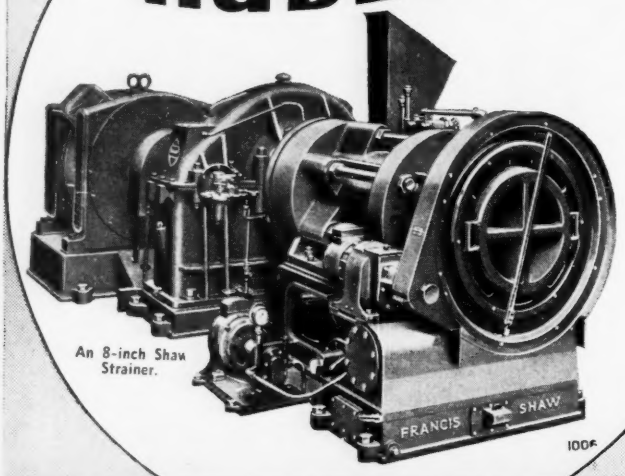
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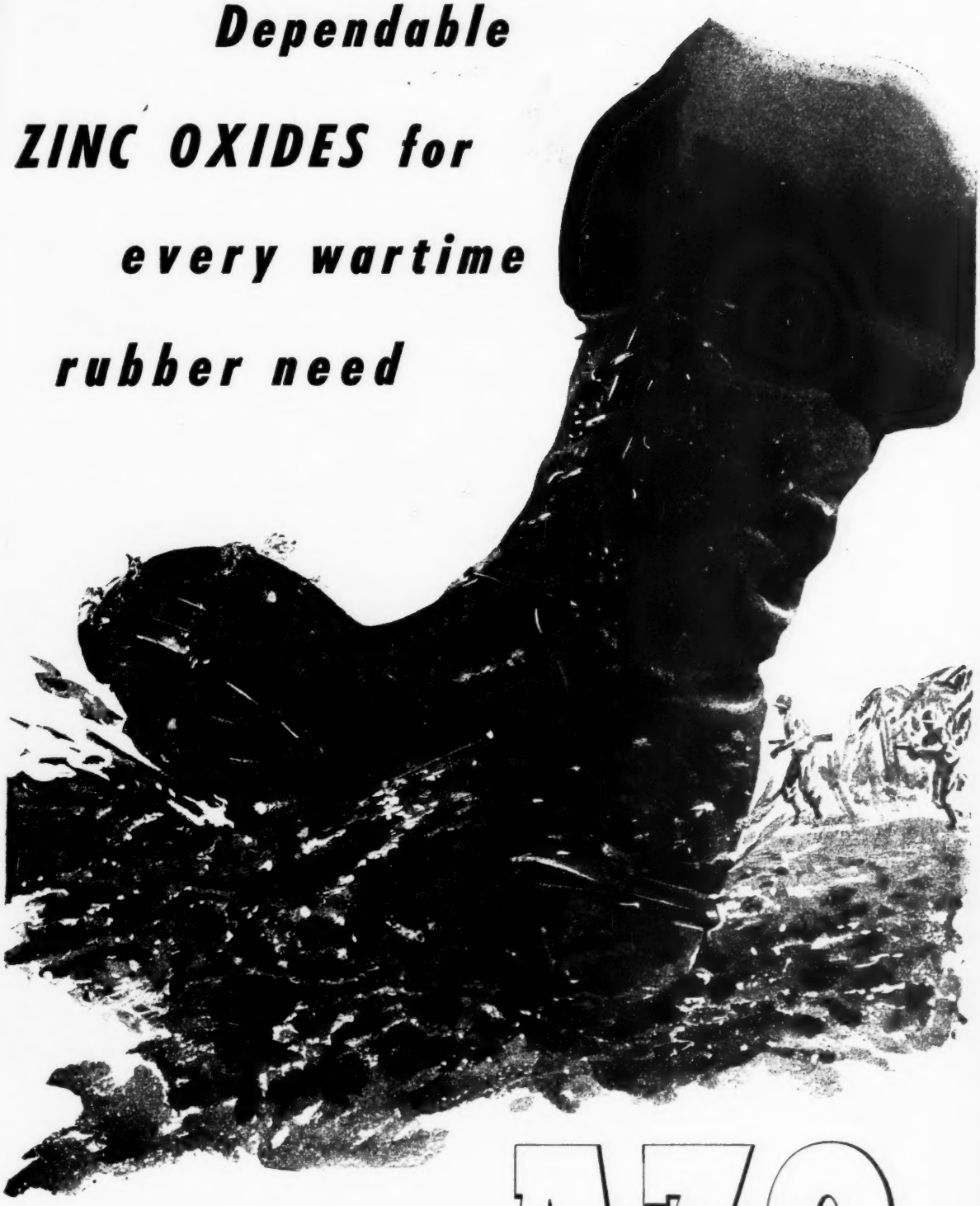
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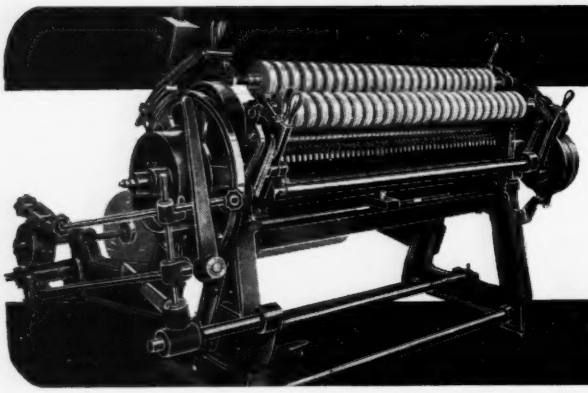
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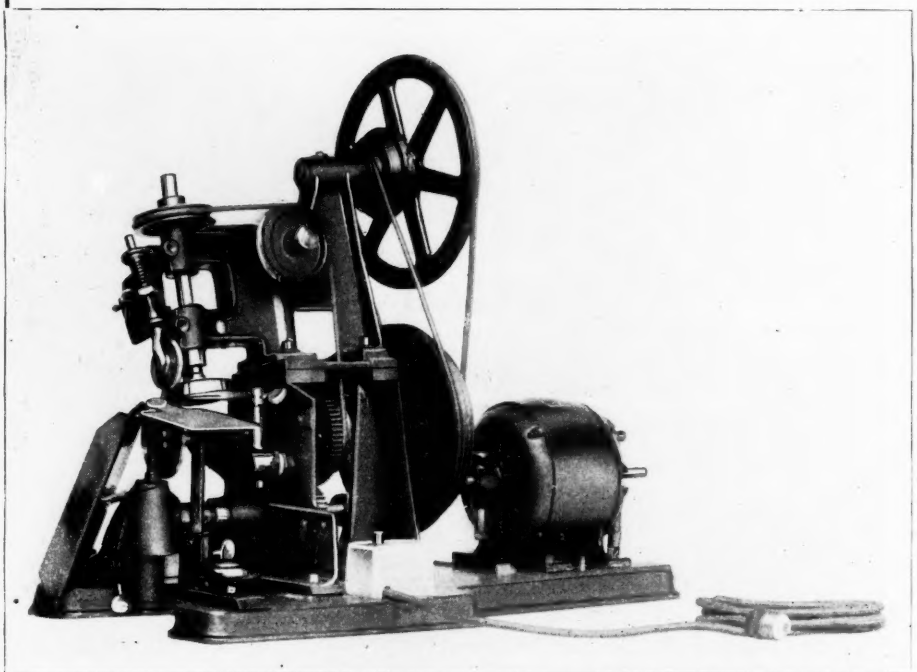
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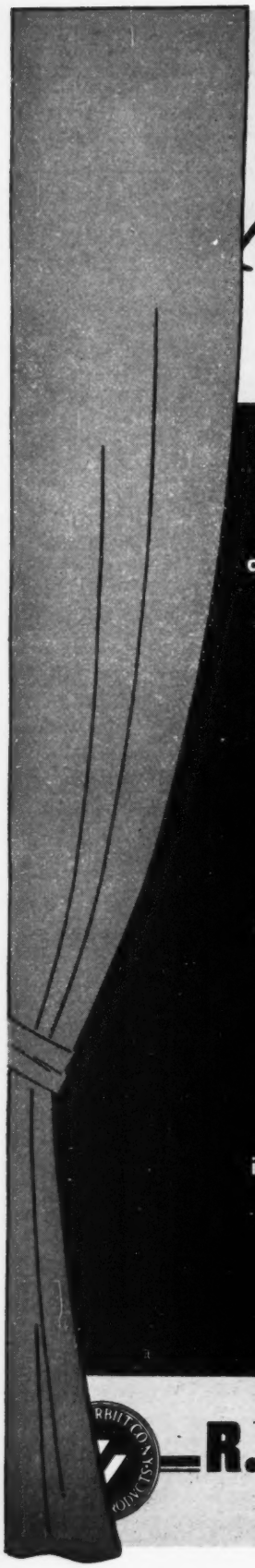
Representatives:
Akron: J. M. Pittenger, 2014 First Central Tower—JEfferson 7131
Chicago: E. J. Nealy, 333 N. Michigan Ave.—STate 1266

Published monthly by Bill Brothers Publishing Corp., 386 Fourth Ave., New York 16, N. Y. Chairman of Board and Treasurer, Raymond Bill; President and General Manager, Edward Lyman Bill; Vice Presidents, Randolph Brown, B. Brittain Wilson.

Subscription price—United States and Mexico, $3.00 per year; all other countries, $4.00. Single copies, thirty-five cents. Other Bill publications are: GROCER-GRAPHIC, PREMIUM PRACTICE, RUG PROFITS, Soda FOUNTAIN SERVICE, TIRES Service Station, Sales Management.

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Volume 113 **New York, October, 1945** **Number 1**

The American Rubber Industry Looks Ahead

An Editorial Survey

LATE in August the Committee for Economic Development made public the results of its study of postwar markets as estimated for 20 major manufacturing groups by the manufacturers themselves. The aggregate forecast of manufactures in the postwar year 1947, with which this study deals, indicated an increase of 41.6% over the aggregate value of manufactures in the year 1939, which was taken as the last more-or-less-normal prewar year. The increase for the rubber products manufacturing industry was estimated as 47.3%.

With the sudden and unexpected end of the war in the Pacific, the forecast for 1947 can now be considered as being more applicable to the year 1946, and INDIA RUBBER WORLD has attempted to collect together pertinent information in recent reports from Washington agencies and from representative rubber manufacturing companies to present in the form of an editorial survey on the reconversion problems of the rubber industry under the heading of "The American Rubber Industry Looks Ahead." The results which have been incorporated in this article are not those of a statistical market survey, but rather a compilation of opinions as expressed by heads of government agencies and of rubber manufacturing companies concerned with the problem of converting the industry to peacetime production and what important factors in the fields of government, management, and labor require the most emphasis.

Report of Rubber Industry Advisory Committee Meeting

The Rubber Industry Advisory Committee of the War Production Board held a meeting on August 28 in Washington, D. C., with R. S. Wilson, WPB Director of Rubber Programs, presiding.

The report of this meeting carried first a statement by the Chairman of the WPB, J. A. Krug, in which he pointed out that since the continuing problems in connection with rubber are of the utmost importance to the country as a whole, as well as to the rubber industry, the WPB has been trying to develop within the government a more effective means of dealing with them. The WPB has therefore suggested and the Director of the Office of War Mobilization and Reconversion has agreed to create within his agency an overall policy committee with authority to act on rubber problems. The WPB, the Department of State, the War and the Navy departments, and the Reconstruction Finance Corp. will be represented on this committee, and it is believed that this committee should be of great help in determining policies with respect to the importation of natural rubber from liberated areas, and its relation to the synthetic program. William L. Batt, WPB vice chairman for international operations was appointed to head the inter-agency committee as a representative of OWMR.

As a second step, the WPB is seeking to obtain immediate information on the rubber situation in the Far East, Mr. Krug stated. Both the Department of State and the Army have agreed to cooperate fully in securing this information, and these government departments have also promised to try and arrange for several experts from the rubber industry to visit the territories that will be reoccupied by the British and the Dutch and make sure that the United States has first-hand information about conditions there.

Mr. Krug also said that the WPB is endeavoring to eliminate all possible controls, but that these controls are not removed until careful consideration is given to each case. Within the next several weeks the number of WPB orders will be reduced to 35 or 40, including those on tin, natural rubber, graphite, antimony, a few chemicals, some textiles, and certain types of forest products. In the case of those orders which are continued the WPB must plan an orderly way of handling the problem even if it is likely to last longer than the WPB itself.

United States Rubber Position

Very rough estimates of the supply of natural rubber available to the United States between now and the end of 1946 were discussed at the Rubber Industry Advisory Committee meeting. It is understood that about 50,000 tons of natural rubber are expected from the Far East between now and January, 1946, and about 350,000 tons during 1946.

Everett G. Holt, of Rubber Development Corp., clarified the question of the present cost of natural rubber to the government by saying that the average cost of rubber from accessible areas ranges from 40 to 45¢ a pound, including allowance for a large portion of the total coming from Ceylon and for the low price of guayule from Mexico. Rubber agreements with Latin American countries originally ran to December 31, 1946. The prices agreed upon initially were in some cases increased subsequently, and those increases are in most cases effective through June 30, 1946, and some even through June 30, 1947. However, if there are large arrivals of rubber from the Far East, the price paid for Latin American rubber under the agreements will not have a marked effect on the average price of all imports, Mr. Holt said.

As far as the Rubber Bureau has been able to determine, the commitments affecting British areas end with the third quarter, since they are made on a quarterly basis, Rubber Director Wilson stated. It is possible, however, that commitments may have

been made by the British to growers in Ceylon which would affect future negotiations.

In connection with the supply of synthetic rubbers, Stanley T. Crossland, executive director of the Office of Rubber Reserve, told the Industry Advisory Committee that more than 1,100,000 tons a year can be produced if necessary. Domestic production in 1945 will consist of about 795,000 tons of GR-S, 50,000 tons of GR-I, and 40,000 tons of GR-M.

Mr. Crossland gave the following figures on production trends:

PERCENTAGE OF GR-S PRODUCTION FROM ALCOHOL AND PETROLEUM SINCE 1943

From	1943	1944	First 7 Months of 1945	Last 5 Months of 1945*
Alcohol	77	64	49	26
Petroleum	23	36	51	74

*Estimated

The following figures on trends in the cost of synthetic rubbers were also given:

AVERAGE COST (WITHOUT AMORTIZATION) OF VARIOUS SYNTHETICS SINCE 1942—¢ PER POUND

	1942 and 1943	1944	First 5 Months of 1945
All GR-S	35.5	30.7	27.2
GR-M (Neoprene)	29.0	24.0	21.0
GR-I (Butyl)	71.0	27.0	16.5

If the use of GR-S is drastically curtailed when ample supplies of natural rubber become available, the important factor will be the heavy capital investment rather than widespread unemployment. About 700 million dollars has been invested in government-owned plants for which the Office of Rubber Reserve has not established any policy with respect to amortization or depreciation.

Without including the expense of idle or stand-by plants, 500,000 tons of GR-S could be made at less than 15¢ a pound without amortization cost, it was reported. The average cost of amortizing the 700 million dollars on a five-year basis with a production rate of one million tons a year would be around 6¢ a pound.

The costs of GR-M reflect fluctuations in the price of calcium carbide and depend on the demand for this special-purpose synthetic rubber. On the basis of an annual production rate of 50,000 tons, the amortization charge on a five-year basis for the government-owned plant in Louisville, Ky., would be about 7¢ a pound.

The reason for the relatively high cost of GR-I has been the difficulty encountered at the first plant at Baton Rouge, La., but it was said that in the near future it should be possible to reduce the cost.

Mr. Wilson pointed out that the future of the synthetic rubber industry will be one of the subjects studied by the overall policy committee of OWMR.

Reclaimed rubber may be one of the types of rubber that will be short during the next year, the Rubber Director told the Industry Advisory Committee. Production now is about 20,000 to 21,000 tons a month; whereas the requirement under Basis VIII tire and tube production schedule will be 24,000 tons. Increased production will therefore be necessary to provide enough reclaim for Basis VIII and for other products which are released from the non-permitted list.

The Rubber Director inquired of the Industry Advisory Committee whether stocks of natural rubber in the United States should be maintained at the present level of 100,000 tons, and the committee members expressed the opinion that no reduction should be made at present. Spokesmen for a number of interested government agencies also opposed any immediate reduction below 100,000 tons. Mr. Wilson also reported that he considered any reduction below 100,000 tons unwise.

Reconversion to Natural Rubber

While no immediate decision can be made as to the utilization of the increasing supply of natural rubber or the required level of synthetic rubber production, the WPB Rubber Bureau explained that the first step has been to relax restrictions on the use of synthetic rubbers and reclaim and a gradual relaxation of Rubber Order R-1 specifications as natural rubber becomes available. The reconversion pattern is the work of technical consulting committees from the industry and not the Rubber Bureau as such, it was pointed out, and more cooperation will be required of the industry under this program, Mr. Wilson commented, since the element of wartime compulsion is not a factor as it was when R-1 was issued. He urged the industry to release well-qualified men for work on the technical committees, as they are still faced with important problems.

Reconversion patterns have already been worked out for tires and tubes and mechanical goods, and plans for the rest of the industry should have been completed by the middle of September. The tire program has been arranged so that certain sizes of tires can return to a higher use of natural rubber before the entire group which would involve much higher consumption and therefore considerable delay.

The technical consulting committees are also making a detailed study of the amount of synthetic rubber which could be used in American products and still enable them to compete on an equal basis in the world market with products made entirely of natural rubber.

Tentative Basis VIII Tire and Tube Production Schedule

The tentative Basis VIII schedule on tire and tube production for the fourth quarter of 1945 and the year 1946 was prepared by estimating that deferred needs and a substantial percentage of the inventory deficiencies for both passenger and truck tires will be satisfied by the end of 1946. This requires the production of 11,774,000 passenger tires and 4,478,000 truck tires in the fourth quarter of 1945 and the following production for 1946:

	Units
Passenger-Car Tires	
Replacement and export	44,000,000
Original equipment	22,000,000
Total	66,000,000
Trucks and Bus Tires	
Civilian replacement	8,188,000
Civilian original equipment	5,320,000
Export	1,177,000
Military	385,000
Off-the-road	310,000
Total	15,380,000

A check of the total requirements for milled stock necessary to meet the Basis VIII schedule shows that peak demand will materialize in the third quarter of 1946, at which time maximum capacity will be 14% greater than the demand. This calculation does not take into account 50 Banbury mixers involved in the cancelled expansion program. They are in various stages of completion and would bring the safety factor to 34% if included in the calculation.

Final Cut-Backs in the Plant Expansion Program

W. James Sears, deputy director of the WPB Rubber Bureau, told the Industry Advisory Committee that immediately after V-J Day the WPB had withdrawn its sponsorship of all uncompleted facilities for rubber products except those for washing natural rubber. This action was taken because existing facilities were adequate to meet the Basis VIII schedule. However the WPB has recommended to the Director of War Mobilization and Reconversion the continued operation of Defense Plant Corp. facilities that are actually producing tires and tubes, at least until rationing can be lifted.

Committee members were supplied with a list of rubber processing equipment, the manufacture of which has been financed by the Office of Defense Plants, and which the manufacturers had been unable to ship because of cut-backs and the final cancellation of the program. Members of the industry interested in acquiring such equipment were told to consult the nearest disposal agencies, a list of which can be obtained from any office of the Surplus Property Board.

G. M. Tisdale, assistant to the Director of Rubber Programs, explained that the Rubber Bureau has specifically requested the completion of two facilities for washing natural rubber, both of which will in effect be government owned. The ODP facility at The Dayton Rubber Mfg. Co. will have a capacity of 6,000 tons a year, and the facility at the United States Rubber Co. will wash 10,000 tons a year. The addition of these facilities will bring total washing capacity to 76,000 tons a year on the basis of

two 10-hour shifts for the washing operation and continuous drying. While it will probably be necessary to wash between 100,000 and 110,000 tons, Far Eastern rubber can be washed more quickly than South American and African, and imports of the latter will tend to decrease in the future.

The Component Situation

Mr. Sears explained that the estimated consumption of cord represents the requirements of the tire segment of the industry only; whereas the figure for carbon black represents the demand of the entire rubber industry.

Requirements for high-tenacity rayon tire cord in 1946 are estimated at 185 million pounds, which is substantially below the Basis VIII figure and well within production possibilities. The present production rate is 175-195 million pounds a year, and the rated capacity of the industry is about 240 million pounds. Because of the lower requirement the WPB Textile Bureau has withdrawn its sponsorship of the ODP expansion. The rayon industry reports that it will probably produce 200 million pounds.

The requirement for cotton tire cord, on the other hand, is higher than under Basis VII because of the increase in passenger-tire production. As the requirement for 1946 is 252 million pounds, compared with a production rate of 205-215 million pounds at present, the output must be substantially increased. However the rated capacity is 320 million pounds, and the Textile Bureau expects at least 260 million.

While no decision has yet been made on the status of M-317A, which establishes allocation control for cotton broad-woven fabric, enough material should be released by military cut-backs to supply the needs of the industry in the fourth quarter. Apparently some allocation will be made in the fourth quarter, after which time allocations will be eliminated.

When the question was raised about emergency allocations of broadwoven fabrics to plants where military contracts have been cancelled, W. R. Lantz, of the Rubber Bureau, advised that the producer may appeal to use the allocated fabric for civilian goods. Furthermore the Textile Bureau is relaxing M-317A so that mills may sell goods without a rating when there has been a cancellation in direct military procurement.

Consumption of carbon black in 1946, according to Basis VIII, will be 976 million pounds, which is less than Basis VII and also below the present production rate of about one billion pounds a year. The Chemicals Bureau anticipates a 1946 production in excess of one billion pounds and has withdrawn its sponsorship of seven uncompleted ODP facilities.

In view of the fact that there is ample capacity to produce channel black even for maximum civilian production, Michael Deutch, of the OWMR, asked when the subsidy on carbon black will be discontinued. Since the industry bears the cost, it would benefit by having the subsidy ended. Mr. Tisdale stated that the subject has been discussed with officials of the Chemicals Bureau. It is necessary to consider a number of factors, such as the price of the gas that will be available, and the program must therefore be worked out carefully, but it will be acted on as quickly as possible, he said.

Rationing

John D. Mann, chief of the OPA Tire Rationing Branch, told the committee that the OPA can end the rationing of tires only upon instructions from the WPB, although the OPA has numerous administrative reasons for wishing it terminated as soon as possible. The committee felt that it would be a mistake to eliminate rationing until the supply-demand situation improves.

When an industry representative reported the opinion of the footwear segment that the rationing of rubber footwear should be discontinued immediately, Mr. Sears said that this request would be transmitted to the OPA at once.

Prospective Changes in the Rubber Bureau

Modifications in R-1 and elimination of most of the forms handled by the Rubber Bureau will permit a 50 to 60% reduction in the staff and a reorganization of the Bureau by October 1, Mr. Sears reported. The production staff at that time will combine the present divisions on tires and tubes and rubber products. The technical staff will be the same as it was or perhaps will be even larger. There will be two operating divisions on rubber supply and statistics, and a distribution division where all the paper processing will be handled. It is expected that the personnel of the Bureau will be reduced to about 80 on October 1, to perhaps 75 a month later, and then to 60. The minimum staff in the Rubber Bureau, or in whatever office that may carry on its functions, will presumably consist of about 30 salaried employes and an additional group of dollar-a-year consultants.

Individual Company Comments

The comments of several rubber goods manufacturing companies given below, which have been received by INDIA RUBBER WORLD in response to our request for their views on the problems of reconversion to the production of peacetime goods, in general, exhibited a feeling of considerable optimism. In a few cases manufacturers replied that they preferred to delay making any statement until government policies regarding labor, taxes, and pricing are decided upon during the present session of Congress.

Continental Rubber Works

Paul H. Henkel, vice president and general manager of Continental Rubber Works, Erie, Pa., expressed the opinion that the rubber industry should be able to resume the production of peacetime items without loss of time.

"It is true that manufacturing processes of the prewar era differed in some respects from the procedures which came into active use when it became necessary to handle large tonnages of synthetics, but basically the same equipment is being and will continue to be employed," he said.

"Of course, the overall efficiency obtainable at this time is not equal to that which would readily be maintained while the industry handled stocks compounded with crude rubber. However, much has been learned during the war years, and the industry should be able to turn out high-quality merchandise at a good rate of speed.

"As a matter of fact, the products our industry will supply in postwar days will be more serviceable than prewar items in many instances, for the reason that specially designed synthetics are now available to rubber technologists, which did not exist during the period when the rubber industry relied almost entirely on crude rubber, conventional types of reclaim, a variety of blacks, sulphur, and the customary organic chemicals.

"The full development of specially designed or tailor-made synthetics has only begun, and it may well be expected that many of the items the rubber industry will turn out in the future will display enhanced fat and oil resistance, increased wear resistance, better aging qualities, improved resistance to elevated temperatures, greater flexibility at low temperatures, more pronounced resistance to the diffusion of gases, as well as a certain amount of flame resistance, to mention only a few of the improvements which may be looked for and which should put the industry in a position to serve the consumer more effectively than ever before.

"Whether this can be done on a sound economic basis remains to be seen. The industry's record was none too good in that respect in the prewar days when constant progress in serviceability of its output did go hand in hand with decreasing returns to the investor. Obviously, unless the industry can sell its product at a profit, it cannot hope to function for any length of time, and that must be realized by all of the various groups entering into the production, marketing, and absorption of its output.

"It is equally evident that its products must be made available to the public at the lowest price possible, and that the men operating the industry's machines, those employed in drafting rooms, laboratories or in the field offices, must remain fairly compensated. However, on their part, they must be ready and willing to deliver a fair return for the wage or salary received.

"That the maximum degree of economic stability be attained by the industry is imperative. It will require honesty of dealing, open-mindedness, and a maximum of cooperation between consumers, labor, management, and investors, and the exhibition of much patience and wisdom by all. It is, however, the most important postwar issue our industry will have to face.

"At this time more men are definitely needed to meet the productive demands being made upon rubber goods manufacturers. In due course they will be supplied by the returning veterans or from other industries. Speaking of ourselves, after having had cancelled or terminated approximately 35% of the backlog of orders carried as of August 30 and in spite of having maintained a full work week, we find ourselves undermanned at this writing

(September 11) to the extent of 15%. Reports from other plants reflect more or less the same condition, and this is most significant.

"We participated in the compilation of figures for the Committee for Economic Development and evaluated the volume of our postwar business rather conservatively. We are now inclined to think that our output will run higher than tabulated a year or so ago.

"We have confidence that we will remain fully employed for a considerable period ahead. We look for moderate, but steady expansion of our operations and are proceeding accordingly," Mr. Henkel concluded.

Pharis Tire & Rubber Co.

In his reply Furber Marshall, president of the Pharis Tire & Rubber Co., Newark, O., reported as follows:

"Reconversion has been a small problem to us, since with the cancelling of orders for military tires we simply started building tires for civilians. I see no reason to believe the figure given by the Committee for Economic Development isn't as accurate now as when it was first issued.

"I believe that the rapid cancelling of government control has been an encouraging factor to business, and if we can secure some measure of labor peace, this industry should have a prosperous two years. After that I am somewhat apprehensive as I am afraid that the companies which have greatly expanded through the DPC may start a first-class price war when the requirements of the country are less than the productive capacity.

"We at the Pharis Tire & Rubber Co. are not, at the present time, planning to make any different products than those made in the prewar period," Mr. Marshall said in conclusion.

United States Rubber Co.

President Herbert E. Smith, of United States Rubber Co., New York, N. Y., in a statement prepared for INDIA RUBBER WORLD emphasized the following points:

"All industry in the United States is reconverting to production for peace with a speed no less amazing than that displayed in conversion to production for war. The rubber industry is giving an account of itself of which we can all be proud. Our company is in stride with this rapid forward march toward a national postwar boom.

"By January 1, the rubber industry expects to be producing many products at a rate equal to prewar operations. Passenger-car tires, for which motorists have waited so long, are one of the products for which such production is foreseen. In 1946 their output will exceed all previous records.

"We estimate that the rubber industry will produce goods in 1946 with a value of $1,500,000,000, an increase of approximately 66% over the corresponding figure of $900,000,000 in the prewar year of 1939. These goods will be needed to help fill a long list of wants for a nation of people who are optimistic, in a spending mood, and have the wherewithal to spend in quantities heretofore unknown."

The General Tire & Rubber Co.

A spokesman for The General Tire & Rubber Co., Akron, O., described its attitude toward reconversion in the following manner:

"In the case of General, reconversion was a simple problem. In Akron, we were making tires, life boats, life vests, ponchos, and all-purpose waterproof bags. When all contracts were cancelled, we were able to take into the main plant (making tires), all of the employes of specialty items except 100 women. Most of these either were married to men in the service or are about to be. All are setting up homes.

"We are still short of help, but were converted to civilian production within 24 hours after contract cancellations reached us. Our production is not yet at a prewar level for two reasons. We do not have enough manpower, and the production per man per day has decreased because of the introduction of synthetic rubber, which slowed practically all operations. Within 30 days we expect to be turning out more tires of all sizes at the Akron plants than we ever have before.

"In Waco, Texas, we were making only large-size army tires. All available machinery and heaters were immediately put to work making civilian truck tires. Orders, placed a year ago, for passenger tire building machines, are being expedited, as is the delivery of necessary molds, and we expect to begin production of passenger-car casings about October 15, with an ultimate daily capacity of 2,200 tires in three different sizes. Production of our Waco plant, plus increased capacity at Akron, will almost double our prewar rate of manufacture.

"We had been leasing a plant in Huntington, West Virginia, to build launching platforms for robot bombs, and for assembling mobile machine shops for the army engineers. This plant was shut down completely.

"In Pasadena, California, we were producing Jato rockets at a rate of 40,000 a month. Contract was cut back to 4,000. We also had taken over the management of a company making missile rockets at Pasadena. Orders were cancelled, but in both plants we are continuing research.

"The government-owned synthetic rubber plant at Baytown, Texas, is still producing at the wartime rate.

"Our cotton mill at Barnesville, Georgia, was not affected by the conversion problem, and we are adding more men to the payroll as they are discharged from the services.

"Our activities in foreign countries are being expanded, particularly in our Mexico City plant.

"This gives an idea of actual reconversion. We lost about 600 men at Huntington and an equal number at Pasadena.

"Balancing this is our program for the postwar period just starting. In addition to the manufacture and distribution of tires, we are entering several other fields, which will more than make up for the loss of military business. In conjunction with the Liquid Carbonic Corp., Inc., of Chicago, we are entering the refrigeration field. We plan to put out both a quick freezing unit and a combination refrigerator and freezing unit. Both are designed for the kitchen. Max M. Gilman, former president of Packard Motor, has joined the General Tire organization to head up this activity. In many cities distribution will be through General Tire dealers. In others it will be through department stores, electric appliance stores and other outlets.

"We are also going to turn out for distribution through our stores, a home cooling unit with large attic fans, which has proved cheaper and more satisfactory in the home than air conditioning. A storm window, saving 30% of the winter's fuel bill, is another item on which we are concentrating.

"With this expanded activity, with dealers in a financial position never before attained, with expansion of our home sales organization, and with a new laboratory devoted to research into all types of rubber usage, we anticipate, as far as General is concerned, a postwar business double that of our biggest prewar year."

Dayton Rubber Mfg. Co.

A. L. Freedlander, head of Dayton Rubber Mfg. Co., Dayton, O., commented on reconversion as follows:

"Probably the best answer as to whether or not Dayton Rubber had a reconversion problem is in the fact that on August 16, two days after V-J Day, we were hiring additional workers.

"Dayton Rubber has occupied an unusual position in this great industrial area for many years from the standpoint of steady employment for its workers. All through the depression we had one of the highest average weekly payrolls in this section. We are aiming to do everything within our power to maintain this fine record.

"Naturally, we have had some minor adjustments to make since V-J Day, such as the adoption of the 40-hour week and rescheduling of certain lines.

"The things that are receiving our greatest attention at this time are the new formulae, processing, and construction features that were the outgrowth of our research and development up to the time of Pearl Harbor, and which had to be tabled on account of the war, and also, the many new things learned during the war. The great advancement of the various synthetic rubbers and fabrics alone will offer a wide range of improvements in product performance and life. Furthermore, when natural rubber again is available in sufficient quantities, we have the possibility of blending it with the various synthetics to open up additional fields of improvement in certain products.

"As one of the pioneers in the development and marketing of synthetic rubber products since 1933, we believe the future holds great possibilities for many new uses of synthetic materials. With a large and modern research laboratory soon available, our efforts in that direction will be given considerable impetus.

"We are getting ready to launch several new products in our automotive, industrial, printing, and textile divisions which should put our first postwar year's volume well ahead of that for the year 1939. The C. E. D. estimate of a 47.3% increase for the industry for the first postwar year, as compared to 1939, is reasonable in our opinion and, if accomplished, will be a fine contribution to the country's overall economic structure.

"We believe our government is aiming to return all controls to industry as rapidly as possible. A good start has already been made, and if government, labor, and management will work together, our postwar economy should quickly get into a highly satisfactory state."

Manhattan Rubber Mfg. Division, Raybestos-Manhattan, Inc.

The Passaic, N. J., plant of Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., had relatively few reconversion problems and was not forced to lay off workers in any great numbers, Harry E. Smith, general manager of this company reported to a local newspaper and to INDIA RUBBER WORLD. Manhattan's peak wartime employment level, about 4,000, will be maintained and within six months about 250 additional men will be hired for mill work, he declared.

Cancellations have reduced government contracts 50%, but redeployment within the plant and reduction of working hours in several departments have made possible retention of almost all employes.

Mr. Smith explained that during the war years the Passaic plant produced a large variety of different products for many diversified industries. When the government cut back war contracts, not all of Manhattan's customers were hit at one time.

The Passaic plant made few "finished products," for the consuming public. Parts went into the manufacture of other items, such as farm tractors, trucks, etc. When other industries started converting for peace, Manhattan kept pace.

During the war, Manhattan produced, directly and indirectly, about 50% for the Armed Services. This has been cut to 25%.

At persent the plant is producing for farm implement manufacturers, which at this time are operating at full capacity. Later, when the farm implement industry has caught up, Manhattan will be ready to produce for the automotive industry, which has not yet started full-scale production, Mr. Smith said.

By January 1, 1946, the plant should be producing about 50% more than in 1940 and only about 20% less than during the peak wartime period. The plant is expected to continue production of many items for overseas shipment, which is considered one of the best markets.

Manhattan will continue to use synthetic rubber, but only in manufacture where it was used before the war.

This company will not enter into any new, major activities at this time. War goods manufacture will be replaced by prewar activities, such as the production of bowling balls, rubber mats, and other rubber goods not produced during the last four years.

Sun Rubber Co.

Dispelling current rumors of the immediate return of all-rubber playthings, rising from WPB's recent release of synthetic and reclaimed rubber for that type of production, T. W. Smith, Jr., general manager of Sun Rubber Co., Barberton, O., stated that "in our opinion there will be only a few rubber toys—of the simpler type and in limited quantities—available for the coming Christmas season."

In a clarifying analysis of the situation, Mr. Smith outlined the problems faced by his own firm—one of the leaders in the rubber toy industry before it entered into 100% war production, which was maintained fully until Japan's surrender. He pointed out that as formal cancellations of war contracts poured in, Sunruco began at once to put into effect plans carefully laid months earlier for the transition to peacetime production.

"I speak only for ourselves, of course, but I am quite certain other rubber toy manufacturers are experiencing similar difficulties during this shift of industrial gears," Mr. Smith said. "To expect substantial quantities of all varieties of rubber playthings common in prewar days to be ready for Christmas sales—which would mean production and distribution within at most a 75-day period—is sheer wishful thinking."

Mr. Smith went on to explain the twofold purpose of Sun Rubber's postwar program: first, to begin production on items that, by reason of their simplicity of manufacture, can be put into the hands of the consumer in a hurry, and, second, to resume gradually production on more intricate toys such as jointed dolls and other assembled items.

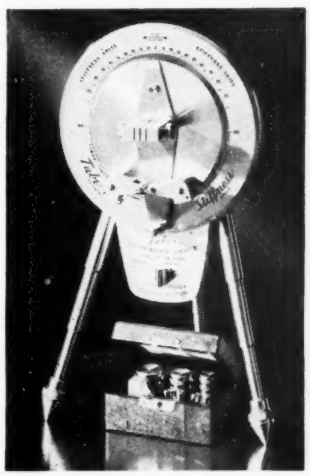
The latter point involves the application of new compounding methods, learned during war production days, to meet the unusual physical and chemical properties of synthetic rubber in the manufacture of toys. With this laboratory work going on, as well as considerable new design and research projects, these next few months offer the ideal time to complete streamlining construction of the Sun Rubber plant for the greater production facilities in the future.

Regarding new toy creations, Mr. Smith commented that Sun Rubber designers are spending full time at their boards and referred to the recent license granted the company by Walt Disney Productions to manufacture reproductions in rubber of all the famous Disney animal and fairy-tale characters.

"By ironing out all difficulties as quickly as possible now, and completing plant reconversion this year, we expect to be in full normal production by January, and look for 1946 to be the biggest toy year in the Sun Rubber Co.'s history," Mr. Smith said in conclusion.

Comments of the Goodrich, Goodyear, and Seiberling Rubber companies were reported in our "News of the Month" section for August. Some additional comment on postwar plans of the Seiberling Rubber Co., however, has since been revealed in a statement made by Col. J. L. Cochrun, vice president in charge of sales for that company.

A broad expansion program, which will make available a long list of products for its tire dealers and will provide them with a heavily staffed point-of-sale merchandising department, was announced by Colonel Cochrun, who at the same time also announced the appointment of D. B. Sayre to manage the new merchandising organization. In addition to tires, the other products will include major and minor household appliances, radios, bicycles and wheel goods, power and hand lawn mowers, and a wide range of automobile accessories, including batteries, spark plugs, seat covers, etc. Manufacturing contracts have been closed with most suppliers, and many of the new products will be ready in the near future.



Taber V-5 Stiffness Gage

New Power-Driven Stiffness Gage

A NEW Taber V-5 stiffness gage has just been put on the market by the Taber Instrument Corp., North Tonawanda, N. Y. The new instrument will measure both initial and normal stiffness characteristics. Elastic drift or "creep" can be estimated from the readings obtained with the machine. The calibrated weighing system is of the pendulum type, which is most responsive and accurate as a means for the measurement of small increments of load. The particular value of the gage is in the determination of standard measurements of the stiffness and resilient qualities of flexible materials up to ⅛-inch in thickness, such as laminated plastics, cardboard, light metallic sheets, and wire. The face of the specimen clamp is mounted exactly on the center of the rotation, thus insuring constant length of the specimen.

A set of calibrated weights is furnished of 500, 1,000, and 2,000 stiffness units and weights of 3,000 and 5,000 stiffness units are available. For the measurement of flexible and very thin materials below 10 units stiffness, an attachment is provided that eliminates mechanical friction and inertia. The instrument is portable, weighing only 15 pounds, and can be plugged into any 115-volt, 60-cycle circuit in the laboratory or plant.

Recent Russian Literature on Natural and Synthetic Rubber—XVII

M. Hoseh

UTILIZATION of Waste from the Tire Industry. Kh. E. Malkina, "Kauchuk i Rezina," 3, 45-49 (1940). **SN-72.**

Elimination of waste calls for reducing waste and utilizing waste. The second aspect of this problem is discussed in this paper. The waste of the Leningrad tire factory consists of: (1) rubberized cord and chafer scrap, (2) scorched rubber, (3) vulcanized inner tube scrap, (4) old curing bags, (5) technical sponge, and (6) crude and sponge scrap. The scrap containing a fabric is now utilized in three ways: (a) for tire repair, patches, sleeves, cups, and similar products; (b) fan belts; and (c) rubber-textile sheet.

The fan belts made of scrap (the process is outlined) are inferior to the usual fan belts. On a testing machine they withstood only 30-37 hours as compared to 70 hours of the usual belt. In actual service they last approximately three months, which is equivalent to approximately 7,500-8,000 kilometers (4,660-4,971 miles). The rubber-textile sheet is made of the scrap remaining after the better and more serviceable pieces were picked out for the foregoing purposes. This sheet is used primarily for making and repairing cheap footwear.

The scorched rubber waste is of three kinds: tread rubber, carcass, and inner tube. Scorched waste is utilized for: (a) sole plate made predominantly of scorched tread rubber; (b) tires for children's bicycles made of the best grades of scorched tread rubber; (c) toys of scorched inner tube; and (d) balls of scorched carcass and defective sponge rubber. The methods of making these products are described. Vulcanized sponge rubber scrap is used for making mats. The sponge is sliced to the desired thickness. The slices are cut into squares, rectangles, rombes, etc., and the pieces are then glued on a fabric. Many of the inner tubes are defective, not because of long service, but because they have an air leak near the valve. The material of which these defective inner tubes are made is quite sound otherwise. Such inner tubes are utilized advantageously as curing bags in tire repair shops.

Combatting Break-Downs. I. A. Aleksandrov, "Kauchuk i Rezina," 3, 54-57 (1940). **SN-73.**

The author classifies the break-downs occurring in the rubber industry in the following groups: I. Break-downs due to faulty equipment and replacement parts. These are chargeable to the suppliers of machinery and spare parts, and the rubber industry cannot be held accountable. II. Break-downs resulting from careless servicing of equipment by the servicing crew. III. Break-downs caused by faulty operation of the equipment by operatives. The two latter groups of break-downs, caused either by negligence or ignorance within the rubber industry itself, are avoidable and should be made so by proper supervision and instruction. Suggestions are offered for various mechanical improvements.

Mechanical Assembly of Tires. P. N. Zmii, "Kauchuk i Rezina," 3, 57-64 (1940). **SN-74.**

This review of assembly-belt methods for making tires gives examples of United States practices (Goodrich and Ford).

Saving Benzine. Relation between the Concentration of Rubber Cement and the Strength of Cemented Joints in Tire Repair. I. S. Levitskii, "Kauchuk i Rezina," 3, 64-69 (1940). **SN-75.**

Generally, the preparation of rubber cement involves the following steps: (1) swelling the rubber mixture—in a hermetically closed container; (2) mixing the cement in a suitable mixer; (3) transferring the cement from mixer to work bench—also done in closed containers; (4) using the cement on the work bench where the container is kept open. In the worst cases, in the absence of mechanical closed mixers, the cement is prepared manually in open containers. Under these conditions the losses of benzine are very great. Also, the cement, when used on the work bench evaporates and requires repeated dilution with benzine.

A series of experiments was conducted to find methods for saving the valuable solvent. Based on observations, it is estimated that the yearly loss by evaporation on the average is 266 kilograms (586.43 pounds) for each working bench. The cement, as used now, is fairly dilute 1:14, 1:10, and 1:5. The justification for using dilute cement is its better penetration and its permitting application of a thin film which is reputedly stronger than a thicker film. Yet it should be remembered that the rate of evaporation is directly proportional to the concentration of benzine.

One series of experiments dealt with the effect of the thickness of the cement layer on adhesive strength. The results showed that in the repair of tires the adhesion between patch and tire is stronger the thicker the layer of cement between them. The minimum thickness of the cement layer should not be less than 0.5-millimeter (0.02-inch). This is apparently due to the fact that thin films cannot cover all the roughness of the joined surfaces. The strength increases rapidly for layers up to 0.5-millimeter thick. Above this thickness the strength increases at a slower rate. Also tested was the effect of the rolling pressure on the strength of adhesion. The results showed that the higher the pressure the greater the strength of adhesion. Another series of experiments dealt with the effect of the cement's concentration. The strength of adhesion was tested on samples cemented together with rubber cements of the following concentrations 1:5, 1:7, 1:9, 1:11 and 1:13. The average values are almost identical regardless of concentration. Therefore it seems that the initial concentration of the cement is irrelevant as far as the strength of the joint is concerned. This is to be expected, since at the time the rubber cement sets, almost no solvent is left in it. The only disadvantage of concentrated cements is the difficulty of applying them to rough surfaces.

The effect of surface roughness on the adhesive strength of joints made with cements of various concentrations was determined on three kinds of specimens: smooth surfaced, roughened with a disk file, and carded. Each of these classes of specimens was cemented in three different ways: (1) using three applications of cements, 1:18, 1:12, and 1:6 in this order, (2) using two applications 1:12 and 1:6, and (3) using only 1:6. The smooth pieces were cemented best with concentrated cement. The slightly roughened pieces were cemented equally well by all the concentrations. The carded specimens were poorly cemented by the concentrated cement. Since in ordinary workaday cases concentrated cements give better results and since the solvent losses of such cements are the smallest, it is advisable to use only concentrated cements in the shops. The use of concentrated cements, e.g., 1:2.5, has the following disadvantage. It is difficult to transfer it from one vessel to another, e.g., from the mixer to the container used on the work bench. This is overcome by using a specially designed appliance. The cement is prepared in a closed mixer and is transferred from there to the bench container with the aid of compressed air. The container kept on the bench is also closed and is connected through a tubing with a special brush. From this container to the tip of the brush, the cement is delivered with the aid of compresed air. Structural details are given.

Industrial Significance of Tau-saghyz. G. R. Stepanov, "Kauchuk i Rezina," 3, 82-83 (1940). **N-27.**

Tau-saghyz is the most valuable rubber-bearing plant in view of its yield of rubber and the simplicity with which it is extracted. Rubber produced from *Tau-saghyz* is equal to or better than im-

(*Continued on page 78*)

Microscopical Studies in Connection with the Extraction of Rubber from Goldenrod

Mary L. Rollins,[1] T. L. W. Bailey, Jr.,[1] and Ines V. deGruy[1]

WHEN this country entered into war with Japan in 1941, the critical situation in regard to rubber stimulated experiments on any and all possible domestic sources of natural rubber.

Under the Stevenson Act (1923-27) the price of natural rubber had been advanced abnormally, and the dependence of this nation on imported supplies of rubber became alarmingly evident at that time. Extensive investigations by Thomas A. Edison in the last years of his life resulted in the choice of goldenrod as a native source of rubber with commercial possibilities. This was not the only rubber-containing native plant, or even the best. Edison knew that guayule contained a greater percentage of rubber, but he saw in goldenrod a plant of great climatic tolerance that could be adapted to the annual crop system and harvested mechanically.

Experiments conducted by the Edison Botanic Research Corp. (1927-1930) showed that rubber could be obtained from goldenrod by solvent extraction.[2] The work initiated by Edison and his coworkers was carried on for a number of years by the Bureau of Plant Industry, Soils, and Agricultural Engineering,[3] of the United States Department of Agriculture, under Loren G. Polhamus[4] and others.

Of all the species of goldenrod tested for rubber-bearing properties, *Solidago leavenworthii* proved the most promising. Experiments in breeding, cultivation, and selection were continued at the Georgia and South Carolina Agricultural Experiment Stations for a number of years in an effort to improve the rubber-producing ability of selected strains of this species.

Similar work was being conducted at about the same period at the Amalgamated Botanical Institute of the U.S.S.R. by N. B. Koyalovich.[5]

While the amount of rubber obtainable from goldenrod had been the subject of investigation for a number of years, no commercially feasible process had been set up for extracting such rubber on a large scale. The development of such a process formed that part of the Emergency Rubber Project assigned to the Southern Regional Research Laboratory in the period 1942-44. This work was carried out as a precautionary measure in case our small, but vital supply of natural rubber from other countries should be cut off. Owing to the present improvement in the rubber situation the urgency of this project is now relaxed, but, in the event of future emergencies, information is available on a commercial process for the extraction of rubber from goldenrod.

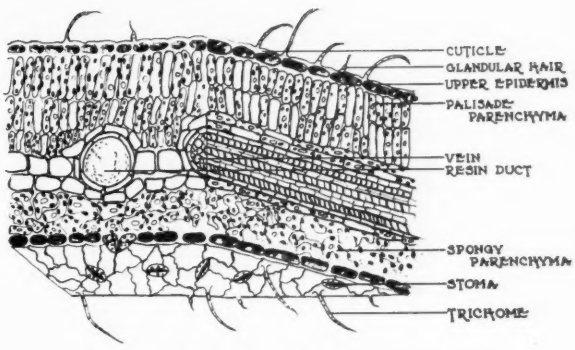


Fig. 1. Diagrammatic Sketch of Goldenrod Leaf

In connection with these investigations, microscopical studies were made to demonstrate the location of rubber in the goldenrod plant and to follow microscopically the effectiveness of various methods for its removal. While there were no established methods for the detection of rubber, standard histological techniques were modified to achieve this purpose.

Methods of Investigation

Goldenrod does not yield a rubber-bearing latex. The rubber occurs in isolated globules and is limited to the chlorophyllous cells which are mainly in the leaf. In addition to rubber, there is in the goldenrod leaf an acetone-soluble complex which occurs in specialized ducts throughout the tissue and which has been loosely and erroneously referred to as "resin."

Usual methods for histological preparations are not applicable to rubber-bearing plant materials. In the paraffin and celloidin techniques whatever solvents are required for removal of the embedding material will also remove the rubber; paraffin itself is a rubber solvent. Various other embedding techniques were tried for microtome sectioning without success. Frozen sections and free-hand sections were found to be the most satisfactory preparations for showing rubber and "resin" *in situ*. Preparation of permanent mounts was not attempted, but natural color photomicrographs were made for purposes of record.

Stains that will color rubber are limited in number. Sudan IV, which is a general stain for vegetable oils, was found to be most satisfactory. Other fat dyes that can be used for the same purpose are Sudan III, Drug and Cosmetic Red 18, Celliton Blue, and Calco Oil Blue.[6] The red stains were considered preferable because blue is so transparent in thin section or dilute solution

[1] Southern Regional Research Laboratory, New Orleans, La. One of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, United States Department of Agriculture.
[2] Thomas A. Edison, Original notes, 1927-1930. (Microfilm, U.S.D.A. Library.)
[3] Formerly Bureau of Plant Industry.
[4] Loren G. Polhamus, "Rubber Content of Various Species of Goldenrod." *J. Agr. Res.*, Aug. 1, 1933. pp. 149-152.
[5] "Chemical Investigation of the *Solidago* Plant." *J. Applied Chem. (U.S.S.R.)*, 9, 1886-92 (1936).
[6] R. T. Whittenberger, "Oil Blue NA as a Stain for Rubber in Sectioned or Ground Plant Tissues." *Stain Technology*, July, 1944, pp. 93-98.

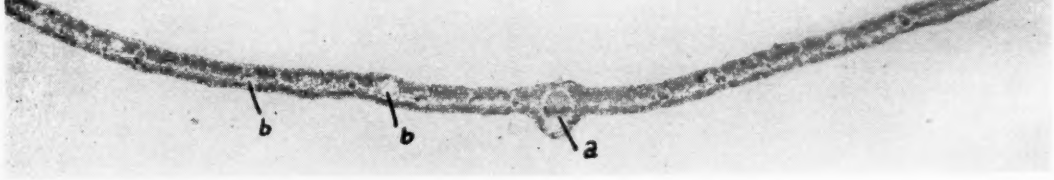


Fig. 2. Cross-Section of Entire Leaf; a, Midrib; b, Resin Duct (Magnification approximately 15×)

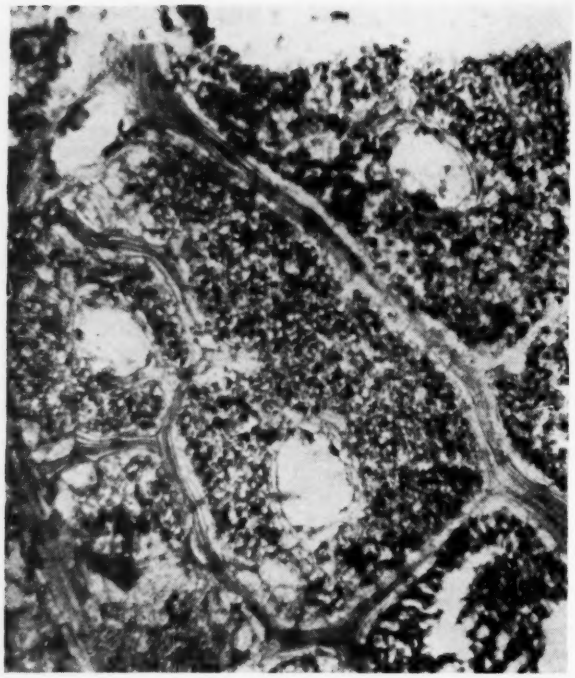


Fig. 3. Longitudinal Section of Leaf Tissue. Note Large Empty "Resin" Ducts. (Magnification 125×)

and because red is more satisfactorily reproduced than blue in the color-photographic process used (Kodachrome). Some 50 microscopical staining techniques were tried out in an attempt to give the "resin" a color different from that of the rubber. These were unsuccessful since both substances stain similarly and are affected only by alcohol-soluble dyes. However, because of their localized occurrence and the difference in refractive index, the two substances could be differentiated. Furthermore the "resins" dissolved readily in alcohol or acetone; while the rubber was only coagulated by these reagents.

In order to increase the contrast between the rubber and surrounding leaf tissues, a stain of a contrasting color was used for the cellulosic parts of the sections.

Iodine green was chosen[7] although methylene blue, hematoxylin, malachite green, gentian violet, safranin, or a number of other stains could have been used equally well.[8] When Sudan IV and iodine green are used, the brilliant red globules of rubber stand out in contrast to the green of the surrounding tissues.

The following staining technique was adopted as generally satisfactory for either fresh or dried material:

1. Section leaves without embedding.
2. Wash in water.
3. Wash in 10% alcohol.
4. Wash in 20% alcohol.
5. Wash in 35% alcohol.
6. Stain with Sudan IV (saturated solution in 50% alcohol) for 10 minutes or until good color appears.
7. Stain with iodine green (0.5% aqueous solution) for several minutes.
8. Mount in water, glycerin, or Karo syrup.

Leaf Structures

By means of these staining techniques, the leaf structure of goldenrod was studied. The leaf is an almost typical herbaceous leaf with a heavy midrib (Figure 1). The only unusual features are the "resin" ducts, which occur at the anastomoses of the veins and seem to be isolated reservoirs rather than continuous ducts. They are filled with a complex oily mixture, the components of which have not yet been identified. This so-called "resin" constitutes from 15 to 20% of the dry weight of the leaf, while the rubber content varies from 3% to 6%. Chemical analysis of the water soluble portion of the acetone extract shows about 12% sugars, 11% quercetin, and 5% organic acids. While the water insoluble portion has not been fully analyzed, a small fraction related to the resin acids or to the saponins has been isolated from it. At least a part of this acetone extractable material is isolated in the system of special "resin" ducts. These so-called "resins" dissolve readily in alcohol or acetone, leaving relatively large empty holes in the leaf sections (Figures 2 and 3).

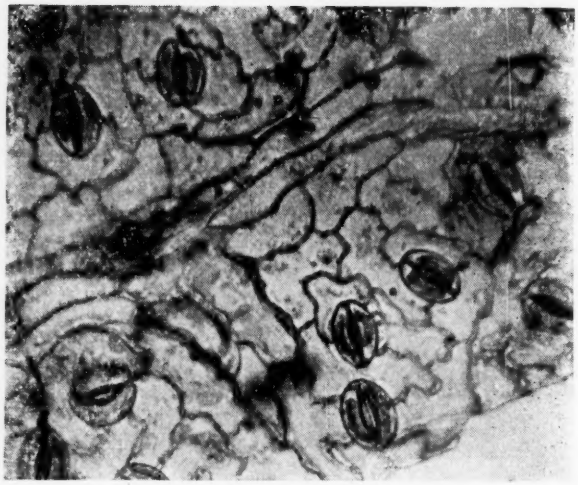


Fig. 4. Epidermal Cells and Stomata. (Magnification 125×)

The cuticular waxes of the epidermal cells, however, are much more resistant than the "resins" and still remain after complete pilot-plant extraction with both acetone and benzene. The upper and lower epidermises seem to be identical except for a greater number of hairs on the lower epidermis. The hairs are of two kinds: (1) pluricellular uniserial trichomes which are particularly numerous along the veins and midrib; and (2) glandular

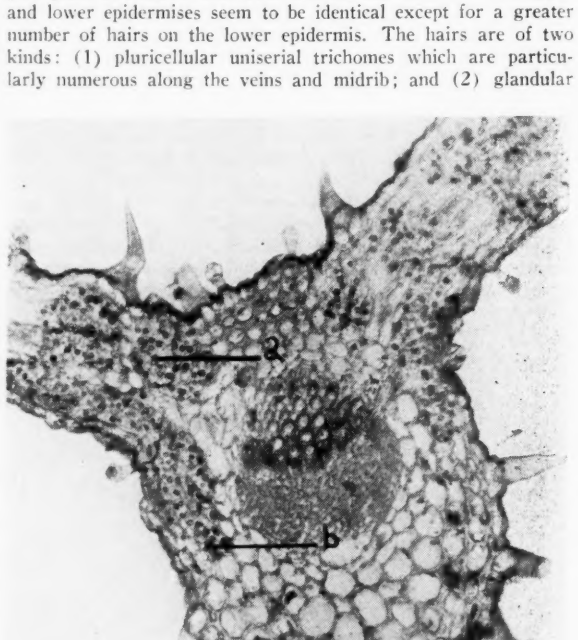


Fig. 5. Cross-Section of Leaf Through Midrib Showing Typical Arrangement of Rubber-Bearing Cells; a, Palisade Cells; b, Spongy Parenchyma. (Magnification 125×)

[7] F. W. Haasis, "Staining Rubber in Ground or Milled Plant Tissues," *Ind. Eng. Chem. (Anal. Ed.)*, July, 1944, pp. 480-481.
[8] D. A. Johansen, "Plant Microtechnique," McGraw-Hill Book Co., New York (1940).

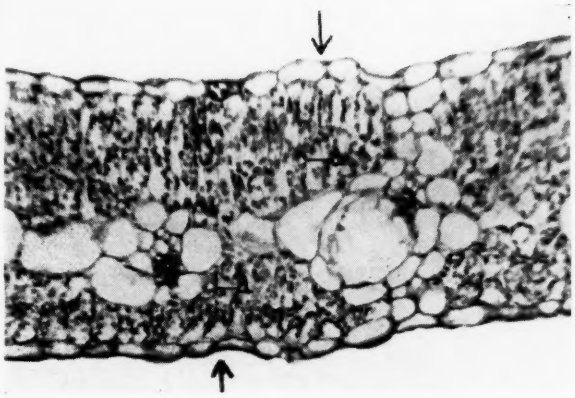


Fig. 6. Cross-Section of Leaf Prepared by Standard Histological Techniques. Note Vacancies (a) in Rubber-Bearing Cells Where Rubber Has Dissolved Out. (Magnification 250×)

hairs which are uniformly tricellular and much finer and more sparsely scattered on the epidermal surface. The prominent stomata (Figure 4) are about equally numerous and uniform on both upper and lower epidermises.

There are usually two or three rows of cells in the palisade parenchyma. These cells are small, measuring about seven by 40 microns, and are solidly massed together. The cells of the spongy parenchyma are normal, but rather closely packed (Figure 5). Between the palisades and the spongy parenchyma there exists an unusual row of large non-chlorophyllous cells similar to those of the epidermis. These occur about equidistant from the upper and lower surfaces of the leaf and more or less in horizontal line with the "resin" ducts (Figure 6).

The rubber occurs in the form of isolated globules floating free among the plastids in the protoplasm of both palisade and spongy parenchyma cells (Figure 7). Usually these globules occur singly and average about two microns in diameter; occasionally as many as five can be found in a single cell, but they are much smaller than usual (Figure 8). Whether this rubber is in solid or liquid state has not been determined. It swells with acetone, and dissolves in benzene, xylol, toluene, or ether. Figure 9 shows a typical palisade cell magnified 1200 times to show the relationship of rubber globule and chloroplasts.



Fig. 7. Isolated Cells from Palisade Parenchyma Showing Relation of Rubber-Bearing Globule to Plastids; a, Plastids; b, Rubber-Bearing Globule. (Magnification 600×)

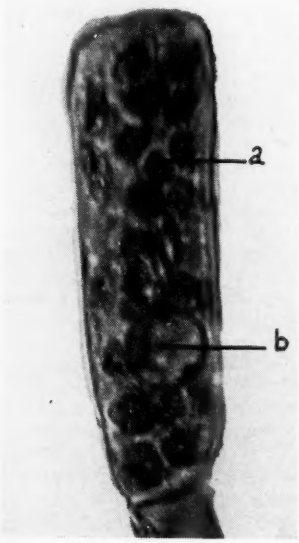


Fig. 9. Single Cell from Palisade Parenchyma Showing Rubber and Plastids; a, Plastid; b, Rubber-Bearing Globule. (Magnification 1200×)

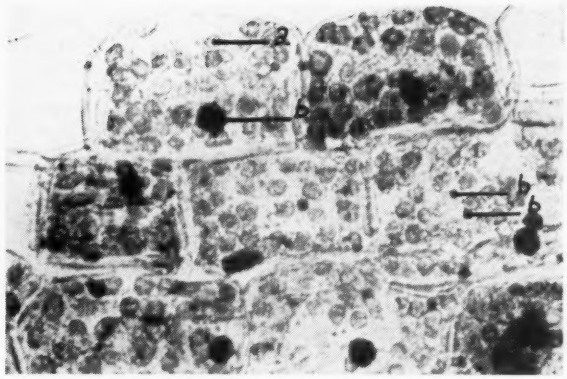


Fig. 8. Group of Cells from Above a Vein Showing Typical Occurrence of Plastids and Rubber; a, Plastids; b, Rubber-Bearing Globule. (Magnification 600×)

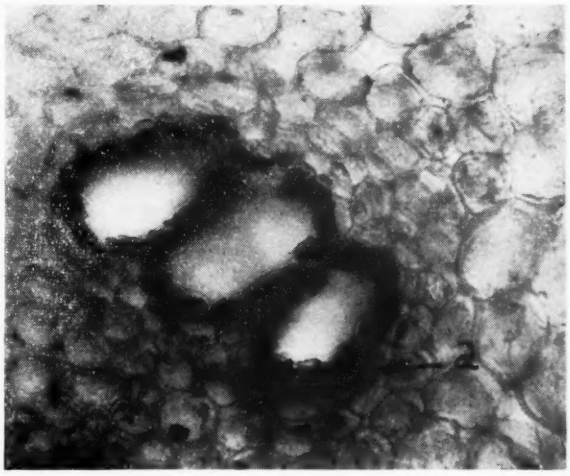


Fig. 10. "Resin" Ducts from Stem, Showing Rubber-Bearing Cells (a) in Rim of Duct. (Magnification 500×)

Stem Structure

There is hardly any rubber-bearing tissue in the stem. Most of the stem is composed of thin-walled pith cells, many of which are packed with colorless needle-like crystals presumed to be raphides of calcium oxalate. The vascular system is confined to the outer one-third of the cross-sectional area; in older stems it is quite woody and occupies a much narrower area.

Near the green end of the stem where growth is rapid, there are many small ducts associated with the young fibrovascular bundles near the edge of the stem. Each of the ducts is surrounded by a *single layer* of rubber-bearing cells. The ducts themselves contain "resin" which readily dissolves in the alcohol of the stain. The "resin" ducts do not appear to be continuous in the stem; although scattered in both pith and cortex, they are rather regularly spaced on either side of the fibrovascular cylinder. Figure 10 shows the location of a duct in the pith and the character of the rubber-bearing cells which surround it. Lower down in the woody base of the stem no ducts are apparent. Red-staining areas in the bark region indicate that the resin ducts and surrounding cells were crushed in the phloem as growth pressure compressed the outer portion of the stem.

Extractions of stem material showed negligible amounts of rubber.

Residues

By means of the microscopical techniques described, observations made at intervals during ball milling, laboratory extraction, and pilot-plant procedures made it possible to estimate the efficiency of these methods. Losses in retting, cooking, ball milling,

and screening procedures were checked, and residues from these processes were examined periodically to detect the presence of unextracted rubber.

Somewhat more than 500 samples of residues from both pilot plant and laboratory extractions were examined microscopically to determine the amount of rubber left in the leaf cells after extraction. A microscopical estimate was obtained by comparing visually at a magnification of 200 the rubber-producing cells that showed red-staining material with the rubber-producing cells that were free of red-staining material. The percentage, as determined microscopically, was based on the premise that if all leaf cells were "empty" (free from rubber), 100% of the rubber would have been extracted. Stem and flower fragments and the epidermal and fibrovascular tissues of the leaf were discounted in this estimation. The results should not be considered comparable to those of anlytical procedures, since it is impossible to break up this material sufficiently to make particle-size measurements or area counts of rubber-bearing particles mixed with the non-rubber-bearing fragments of the leaf. The sampling error is unavodably great, and reported results are relative rather than absolute. Results are reproducible to perhaps within 5% or 10%.

Residues from the early pilot-plant runs sometimes contained 20 to 30% of unextracted rubber cells; final pilot-plant residues were all virtually free of rubber. Examination of residues from laboratory and pilot-plant extractions showed consistently that those from finely ground material retained not more than 5% of the original rubber, and that in many of these samples extraction was really complete; while in the coarsely ground and the unground samples from 20 to 50% of the cells of the residue still contained rubber. This could be predicted from a consideration of the structure of the rubber-bearing portion of the leaf and the unusually small dimensions of the individual rubber-bearing cells.

Retting Experiments

Microscopical examination of leaves retted for 21 days by both aerobic and anaerobic micro-organisms indicated that the anaerobic retting produces a cleaner cell with less trash and dirt, and smaller amounts of protoplasmic residue surrounding the rubber mass in the cell.

A sample of the whole leaves, which had been ensiled in Waynesboro, Ga., was examined by the cross-sectioning technique. The resin ducts were empty; the rubber cells, packed with rubber. The rubber particles seemed to be swollen considerably and occupied a greater proportion of the cell than normally in untreated material; the cell walls seemed not at all disturbed; and the cell contents were only slightly reduced in quantity. Except for absence of "resin," and the swollen condition of the rubber, the effects of ensilage were not apparent microscopically.

Cooking Experiments

Samples of goldenrod were examined in the "wet mash" state after cooking in 0.1% sulphuric acid or 0.5% caustic soda solution. The individual cells were "freer," and cell groups less compact, after the alkali cook than after the acid cook.

Waste liquors were examined after screening, and it was revealed that considerable rubber was being lost in cells which went through the screen. To determine fineness of the mesh required to prevent this, dimensions of the cells were measured.

Ball Milling Experiments

A series of microscopical observations were made at intervals during ball milling experiments to study size and distribution of rubber particles in respect to time of milling. The "worms" of red-staining material were seen to grow progressively larger with increased time of agitation. After the rubber had "balled out," hardly any rubber globules showed in the ball mill liquor. Natural color photomicrographs were made to show changes during the ball milling process and size and distribution of fibrous materials in the ball-mill liquor. The ball milling process was found to be impractical because of the length of time required and the poor quality of the rubber obtained. Rubber obtained by aqueous ball milling was contaminated with resins and fibrous materials, and the vulcanizates obtained from these samples proved hard and inelastic.

Conclusion

By means of histological staining techniques and microscopical observations, it has been possible to demonstrate the location of rubber in the chlorophyllous cells of the goldenrod leaf and the relative non-occurrence of rubber in all other parts of the plant. Extension of these techniques to control studies of laboratory and pilot-plant procedures has made it possible to follow microscopically the various steps in the development of a method for the extraction of rubber.

Microscopical examinations of raw materials and processed residues have shown that the rubber in the leaf of the goldenrod plant (*Solidago leavenworthii*, T. & G.) is completely removed by an acetone-benzene extraction process if the raw material is finely ground before extraction.

Recent Russian Literature

(*Continued from page* 74)

ported rubber. *Tau-saghyz* tires tested on a 1,000-kilometer (621-mile) stretch showed a wear equivalent to that of imported rubber. A species maturing after four years can produce at the end of that period 400 kilograms of rubber per hectare (352 pounds per acre). In addition, starting with the third year a hectare yields more than 50 kilograms of seed (44 pounds per acre).

The Soviet SK Industry. A. V. Petrenko, "Kauchuk i Rezina," 4/5, 1-5 (1940). **S-44.**

A summary of the work done in 1939 is given as well as an outline for 1940. The improvements achieved in production methods in the utilization of labor and equipment, in better utilization of by-products and waste are reviewed.

Thermal Vulcanization of Synthetic Rubber. A. D. Zaionchkovskii, A. N. Zaionchkovskaia, A. P. Pisarenko, and V. A. Astaf'ev, "Kauchuk i Rezina," 4/5, 26-31 (1940). **S-45.**

Experiments were conducted on vulcanizing rubber-carbon black mixtures without sulphur. Various types of synthetic rubber were studied to elucidate their response to thermal vulcanization. The varieties of synthetic rubber studied included divinyl and polydiene rubbers containing up to 20% polydienes polymerized with and without rods, refined rubber and milled rubber containing 0.20-1.77% of alkali and a 1.52-4.82% of mineral admixtures.

The investigated varieties differed also in their mechanical properties. The tensile strength of these rubbers vulcanized in the usual manner varied from 110 to 152 kilograms per square centimeter (1,422 to 2,161 pounds per square inch), and the elongation at break was 362-645%. Test pieces 135 by 135 by 4 millimeter (5.3 by 5.3 by 0.2-inch) were made of a mix containing synthetic rubber 100%, carbon black 60%, and plasticizer 3%. As plasticizer was used stearic acid. Vulcanization was carried out in a laboratory press at 200±3° C. (392±5.4° F.) for 30, 60, 120, and 360 minutes. Vulcanized samples were tested for tensile strength, elongation and elongation set. Judging by these tests, the tested samples can be divided into three groups with respect to their optimum time of vulcanization: namely, 60, 120, and 360 minutes. If the time of vulcanization were tested at closer intervals, the optima could be determined more closely. The tensile strength of specimens vulcanized for an optimum time was 45-60 kilograms per square centimeter (640-853 pounds per square inch); whereas the unvulcanized specimens had a tensile strength of 5-10 kilograms per square centimeter (71-142 pounds per square inch).

Thus thermal vulcanization raised the strength 5-10 times. The shortest time of vulcanization necessary for optimum results required the rod-polymerized samples containing residual alkalis. Apparently the polymerization catalysts affect vulcanization. The elongation set after only 30 minutes of thermal vulcanization drops to values commonly encountered in sulphur containing mixes. All the thermo-vulcanized rubbers displayed a common characteristic: Samples stretched to nearly their breaking point retracted very slowly; however, after 1-2 minutes they returned to their original length. This fact may create a faulty

(*Continued on page* 84)

German Synthetic Mechanical Goods—II

TYPES, constructions, and manufacturing methods of German hose were much the same as in the United States.

Hose

As previously brought out in the section on textiles, the shortage of cotton brought about the use of rayon in all hose. Filament rayon was specified for high-pressure products, spun rayon for low-pressure.

Belt friction compounds were ordinarily used for hose frictions. The general make-up of several types of hose follows:

(a) ¾-1 HIGH-PRESSURE AIR HOSE—made of two-ply braid of 33/5-3 ends or 13/2-3 ends filament rayon, with a 13/64-inch wall. (These cord constructions were the same as used in passenger and truck tires.)

(b) WATER HOSE—½-inch made of two-ply braid of 10/10 or 12/12 spun rayon with ⅛-inch wall.

Three-quarter-inch made of three-ply braid of 10/10 or 12/12 spun rayon with 5/32-inch wall.

(c) HIGH-PRESSURE HYDRAULIC HOSE—for aviation and trucks—made in sizes from 5/32- to ¾-inch. Two to four braids of filament rayon. Each ply was impregnated with cement. There was no cover or any rubber layer between plies. Bursting pressure 600 to 900 p.s.i.

One manufacturer made both a Buna S and Perbunan hose.

The rubber manufacturers did not couple the hose. In fact they did not appear familiar with the details of couplings; with the type or nature of the fluids used in the hydraulic systems; or with the use to which the various types of hose were put. The manufacturers produced to an approved sample and not to specification. Inspection and testing were by the military forces, but at the destination rather than at the source of manufacture.

(d) LARGE OIL HOSE was rough bore. Smooth bore was not made. For six-inch oil-loading hose, a typical construction was:

1. Inner layer—3/16-inch round spiral wire
2. Two plies spun rayon—thickness and weave of 18-ounce hose duck
3. One-ply rubber 1/16-inch thick—compounded with Buna S reclaim (Buna S reclaim reported more oil resistant than natural rubber reclaim)
4. Five plies 18-ounce spun rayon fabric bound down with two spirals of 5/64-inch diameter zinc coated wire
5. One-ply rubber same at item 3
6. Two plies 18-ounce spun rayon fabric
7. One-ply 14-ounce open-weave spun rayon fabric
8. Good grade cover, 5/64-inch thick, both ends reenforced with extra plies of the 18-ounce fabric

The ends were not enlarged; the nipples were not built in place, and the type of coupling was not known to the manufacturer. The hose was required to withstand 200 p.s.i. pressure.

(e) STEAM HOSE—for 120 to 150 pounds' steam pressure was built of a Buna S tube, one inner ply of asbestos cloth, three to four plies of cotton duck, one cotton braid ply and cover. For a lower-pressure hose the asbestos cloth ply was replaced by a cotton duck ply. Rayon was not used in steam hose. It was claimed that Buna S was superior to natural rubber for steam hose.

(f) ROTARY HOSE—2½-INCH DIAMETER

1. Buna S tube—9/64-inch thick
2. Seven plies 18-ounce spun rayon fabric
3. One ply natural rubber—3/64-inch thick
4. One ply braided bead wire—21/1/32
5. Same as 3
6. Same as 4
7. Same as 3
8. One ply 18-ounce spun rayon fabric
9. 5/64-inch cover

There were no enlarged ends and no built-in fittings. It is to be noted that natural rubber was used over, between, and under the braided bead wire.

(g) SANDBLAST HOSE—Buna S tubes and spun rayon fabrics were used. One manufacturer used the same tube for both rotary and sandblast hose. All the manufacturers felt that their Buna sandblast hose tubes were harder than when formerly made of natural rubber and definitely inferior as to service rendered.

(h) BEER AND FOOD HANDLING HOSE—were made of natural rubber. When the natural was no longer available, the manuafcture of these products ceased.

Summary Report—August, 1945—Rubber Bureau, WPB, Office of Rubber Reserve, RFC . . . . . .

Below are representative formulae of hose compounds for various uses as obtained from two prominent German concerns.

CONTINENTAL HOSE COMPOUNDS

	Hydraulic Aircraft & Truck Brake Hose Tube	Hydraulic Aircraft & Truck Brake Hose Tube	Sand-blast Hose Tube	Steam Hose Tube & Cover	Steam Hose Friction
Buna SS			30.0		54.5
Buna S Crumbs	75.0†				
Buna S Defo 500	25.0		70.0	100.0	45.0
Perbunan		100.0			
Ozokerite	1.56		.42	1.1	
Stearic Acid	1.56		1.0		
Softener 77*		20.0			
Softener B.P.K.*		10.0			
Oxydwachs*		7.5			
Paraffin		2.6	.42		
Renacit*		2.0			
Rosin			2.0		6.5
Naftolen	37.5†		10.0	8.9	13.0
Mineral Oil	15.6		4.0		6.5
Softener J*			14.5		
Cumar				6.7	
Softener WK4F*				7.8	
Black CK-4	31.0		50.0	22.0	18.0
Black P-1250	59.0	75.0	24.0	33.0	
Black Durex	31.0				18.0
Clay				22.0	
Kieselkreide*	28.0	25.0			
ZnO		5.0	12.2	10.0	12.5
MgO					1.4
P.B.N.	1.0			5.5	1.5
Aldol Alpha Naphthylamine LS II*		1.5		2.2	
MBT				.9	
MBTS					.36
Vulkacit AZ*	1.56	1.0	.67		1.1
Vulkacit FP*		.5			
Vulkacit TH*				.7	
Sulphur	3.8	2.0	2.8	1.1	2.9
Tensile p.s.i. (Schopper)	—	—	2275	1700	1500
% elongation	—	—	480	200	630
Specific gravity	—	—	—	1.23	1.15
Duro	—	—	65	56	46

* See Appendix (at end of concluding installment).
† 75.0 crumbs and 37.5 Naftolen master-batch.

PHOENIX HOSE COMPOUNDS

	Rotary Sandblast Hose Tube	Air Hose Tube	Water Hose Tube	Rough Bore Oil Loading Hose Tube	Rotary Hose Cover
Buna S-3 Defo 200	71.0				50.0
Buna S-3 Defo 800		40.0			
Buna SS	29.0				
Buna S Defo 500		60.0	16.5		
Buna S Reclaim			83.5	100.0	25.0
Rubber Reclaim					25.0
Factice-Brown			5.3		
Stearic Acid	1.0	1.25			
Paraffin	2.9				
Kautschol*		10.0			
Naftolen		15.0	13.5		
Mineral Oil	5.9				
Ceresin	2.9				
H.M. Oil #3*		28.0			
MRX			13.5		
Montan Wax			2.7		
Black CK-4	17.5	43.5	10.8		28.6
Black P-1250	7.7				7.1
Black Durex				10.0	
Whiting		40.0			
Clay			43.5		
Kieselkreide*					14.3
ZnO	5.4	7.0	5.1	8.5	11.4
Barytes			72.5		14.3
MgO				3.75	
MBT	1.0				
MBTS		1.25			
Vulkacit AZ*		1.25	.8	.75	
Vulkacit TH*					2.9
Vulkacit 1000*	1.0				
Sulphur	1.45	2.75	2.7	2.0	

* See Appendix (at end of concluding installment).

Molded Goods

Methods of Production

For the manufacture of synthetic rubber molded articles, the same conventional methods of stock preparation, type of mold equipment, and times and temperatures of cures were employed as had been the practice with natural rubber. All manufacturers stated that the percentage of rejects was somewhat higher with synthetic than with natural.

There appeared to be nothing new in mold or press design. Molds were of steel; four-opening presses were in general use.

Two manufacturers were using continuous rotary-drum curing in a Berstorff press to cure sheets 41 inches wide and 3/32-inch thick. The curing temperature was 310° F. Speeds varied from a low of 39 feet per hour to a high of 75 feet per hour.

There was no evidence of transfer or injection molding, and the manufacturers seemingly were not familiar with these developments.

CONTINENTAL MOLDED GOODS

	Flexible at —55° C.			Flexible at —45° C.	
	Hydraulic Brake Cup and Oil Seals	High-Grade Soft Perbunan General Use	High-Grade Soft Buna S General Use	Navy Strip for Port-hole and Bulkhead	Very Soft General Use
Buna S			100.0		
Buna S Defo 700				67.0	
Buna S-3 Defo 700	16.45				67.0
Buna S-S Defo 700				33.0	33.0
Perbunan†	83.6	100.0			
Factice-Brown				26.0	83.5
Paraffin	.9				
Softener 88*	25.5	24.0		1.6	1.6
Renacit*	.84			26.0	53.5
Kautschol*		8.0			
Rosin		8.0			
Ozokerite		2.0	.8	1.6	1.6
Softener J*				7.7	7.7
Stearic Acid				1.6	1.6
Dibutyl Phthalate			26.0		
Black CK-4	86.0		20.0	17.0	16.5
Black P-1250		28.0		34.0	33.0
Black Durex	10.0				
Black L-36*			30.0		
Kieselkreide*			10.0	26.0	20.0
Barytes		25.0			
ZnO	5.1		6.4		7.6
P.B.N.	.23	2.0	2.0	1.3	1.3
Vulkacit AZ*	1.62	1.0	.4		1.0
Hexa			.4		
MBTS				.26	.83
Sulphur	1.85	2.0	2.0	3.3	4.0
Tensile p.s.i. (Schopper)	1850	1200	1300	900	400
% elongation	200	710	575	320	280
Specific gravity	1.22	—	—	—	—
Duro	—	40	45	56	34

* See Appendix (at end of concluding installment).
† Perbunan with 1% Renacit.

CLOUTH MOLDED GOODS

	Airplane Engine Mount		Soft Compound General Use
	Perbunan	Buna S	
Buna S (Not Heat Treated)		33.3	
Buna S Defo 500		33.3	
Buna S Defo 700	25.0		
Buna SS (Not Heat Treated)		33.3	
Buna SS†			100.0
Perbunan	75.0		
Polyisobutylene			5.0
Factice-Brown		5.0	
Rosin	3.25		
Ozokerite		1.5	
Cupa*	7.5		
Naftolen	12.5	6.0	
Plasticator #32*		2.0	5.0
Korelen*			7.5
Tricresyl Phosphate	12.5		
MgO			2.5
ZnO	6.2	5.0	32.5
Black CK-4	35.0	7.5	
Black P-1250		8.7	
Black Durex	7.5		
Black L-36*		7.5	
P.B.N.		.45	
Vulkacit AZ*		.75	
Vulkacit F*	2.0		
MBTS			2.25
Sulphur	1.5	1.8	1.5
Tensile p.s.i. (Schopper)	—	—	1425
% elongation	—	—	500
Specific gravity	—	—	1.05
Duro	52	—	43

* See Appendix (at end of concluding installment).
† Buna SS with 3% Renacit.

MOLDED GOODS

	Rheinische Gummi Celluloid			Phoenix Good Grade Sheet Packing Navy 3/32" Thick
	Best Soft Buna S Duro 45	Best Soft Perbunan Duro 45	Best Elasticity Buna S	
Buna S Defo 1000	100.0		100.0	100.0
Perbunan		100.0		
Factice-Brown		19.3		
Softener 88*	6.0	8.0		
Kautschol*				1.6
Rosin				1.6
Ozokerite			.65	
Stearic Acid				1.6
Naftolen	15.2		10.5	3.1
Koloplast*	5.0		10.5	
Polyarden Hartz*		4.8		
Black CK-4		6.6	8.2	
Black P-1250	29.0		24.6	19.0
Black Durex				19.0
Black L-36*		19.6		
ZnO	6.0	4.8	5.0	5.3
P.B.N.	1.6		1.5	
Vulkacit AZ*	1.3	1.1	.85	
MBTS			.45	1.6
DPG				.8
Sulphur	1.8	1.3	1.5	2.1
Tensile p.s.i.	850 (Shopper)	650 (Shopper)	725 (Shopper)	1450 (Scott)
% elongation	650	400	650	450
Specific gravity	1.13	1.14	—	1.12
Duro	45	45	50	60

* See Appendix (at end of concluding installment).

Materials

Buna was used for most purposes. Surprisingly few Perbunan articles were being manufactured. Buna 32 was compounded in a limited degree in soft Buna products, but both Bunas 32 and 85 were employed in hard rubber moldings.

There was no uniformity of compounding practice among the various manufacturers of similar products as to type of softeners, loading, and acceleration. The formulae tabulated were chosen to illustrate some of the special features, such as flexibility at low temperatures of both Buna and Perbunan compounds. Mixtures of Buna and Perbunan found some use. Examples are also given of airplane engine mount stocks, of Navy strip which was manufactured in large quantities, and of formulae designed to give soft compounds with maximum elasticity.

Quality

The physical data given are as reported by the manufacturer. Unfortunately, of the very few samples available, most were of such size and shape as to make difficult the checking of results.

The "Soft General Compound," as shown in the formula tabulation (Clouth), is interesting in that it is a non-black Buna S compound with a low-volume loading of zinc oxide only. To the feel, it was a very resilient stock, with a snappy elastic return when indented by a pencil point. The German manufacturer was quite proud of the compound. Surprisingly, however, rebound tests made in a United States laboratory gave results about 50% as good as can be attained with natural rubber of the same Duro, and not so good as with our GR-S or neoprene compounds. For example, the rebound of a natural rubber stock was 67, against 30 for the German Buna compound. A good neoprene formula will have a 60 rebound, and GR-S, approximately 52.

Summary

Nothing unusual or outstanding was found either in molding practice or compound technic. The rotary press gives a sheet of good appearance, one side having a plated surface, the other the impression of a fine sheeting, but this method of vulcanizing is a rather expensive one.

Rubber Covered Rolls

The two rubber companies investigated, Continental and Clouth, had been the outstanding manufacturers of rubber covered rolls in Germany. The following observation were of interest:

(1) The construction and processing methods in the manufacture of Buna covered rolls were essentially the same as had been used for natural rubber rolls.

(2) One company used a hard-rubber base stock of natural rubber and natural rubber cements; the other used Buna for both hard base stock and cement.

(3) Building difficulties were experienced because of insufficient tack between plies. One company cemented all plies with a Buna cement before building.

(4) Long step-up cures in open steam were used.
(5) No neoprene rolls had been manufactured.
(6) One of the companies made a Perbunan printing roll.
(7) The same rolls were used for textile and paper mills.
(8) Neither company covered bronze rolls.
(9) American fabricating technic is noticeably better than the German. The rubber covered roll field is more highly specialized in the United States, and our technicians are more familiar with the requirements of the product than were the Germans with whom roll coverings were discussed.

The printing roll formulation is as follows. Other compounds are shown in the tabulations that follow.

Perbunan	100
Factice Brown	18.5
Cumar	9.2
Weichmacher Oil*	43.0
Black-P1250	.9
Vulkacit AZ	.37
Sulphur	1.85
The physical properties of this compound are:	
Tensile p.s.i. (Schopper)	250
% elongation	209
Specific gravity	1.02
Duro	26

* Weichmacher Oil—softener of unknown composition.

PAPER MILL ROLLS

	Continental	Clouth	Continental	Clouth
Buna S		100.0		100.0
Buna S Defo 300			46.5	
Buna S Crumbs	100.0		53.5	
Factice-Brown			17.0	
Korelen*		15.0		15.0
Lagerungsschutz*		1.0		1.0
Naftolen	50.0		27.0	
Kormin*	15.0		20.0	
Mineral Oil			3.3	
Black P-1250	25.0		50.0	
Kieselkreide*			60.0	
Barytes (Very Fine)	35.0			
Whiting		25.0		25.0
Clay		20.0		30.0
Titanium Dioxide		15.0		15.0
ZnO		50.0		50.0
MgO	2.5	5.0	3.5	5.0
Aldol Alpha Naphthylamine	1.25		1.7	
P.B.N.	1.25		1.7	
MBTS		1.5		1.5
Sulphur	15.0	3.75	17.0	8.75
Pusey & Jones	80–85	80–85	40–45	40–45

* See Appendix (at end of concluding installment).

CLOUTH ROLL COMPOUNDS

Compound No.	624/41	625/41	626/41	627/41	628/41
Buna SS Chemi*	100.0	100.0	100.0	100.0	100.0
Korelen*	15.0	15.0	15.0	15.0	15.0
Clay	20.0	25.0	25.0	30.0	30.0
Whiting	25.0	25.0	25.0	25.0	25.0
Titanium Dioxide	15.0	15.0	15.0	15.0	15.0
ZnO	50.0	50.0	50.0	50.0	50.0
MgO	5.0	5.0	5.0	5.0	5.0
Lagerungsschutz*	1.0	1.0	1.0	1.0	1.0
MBTS	1.5	1.5	1.5	1.5	1.5
Sulphur	3.75	5.0	6.25	7.5	8.75
Pusey & Jones Hardness	80–85	70–75	60–65	50–55	40–45

Compound No.	629/41	630/41	631/41	632/41
Buna SS Chemi*	100.0	100.0	100.0	100.0
Korelen*	15.0	15.0	15.0	15.0
Clay	30.0	30.0	30.0	
Whiting	25.0	25.0	25.0	75.0
Titanium Dioxide	15.0	15.0	15.0	39.0
ZnO	50.0	50.0	50.0	75.0
MgO	5.0	5.0	5.0	5.0
Lagerungsschutz*	1.0	1.0	1.0	1.0
MBTS	1.5	1.5	1.5	1.5
Sulphur	10.0	12.5	15.0	20.0
Pusey & Jones Hardness	35–40	30–35	25–30	20–24

Compound No.	Hard Rubber 66-100-66
Buna SSR	100.0
Cumar	10.0
Koresin	5.0
Carbon Black	1.7
ZnO	16.7
MBTS	3.3
Sulphur	33.4

Note:—The base stock for all hard rubber rolls was two-thirds of this hard rubber compound plus one-third of compound 628/41 as shown above.

* See Appendix (at end of concluding installment).

Tank Linings

Constructions

There was no uniformity of practice in methods for lining steel tanks. While one manufacturer used a softer under-ply with two different hard top plies, others had no softer under-ply.

For abrasion resistance two of the largest processors used natural rubber compounds. One applied his soft natural rubber on an intermediate natural rubber stock, but the other used a hard Buna stock as a base for his soft natural rubber lining. A third used a Buna covering over a natural hard rubber cement first applied to the metal. In two other cases, Buna coverings over Buna cemented metal were used.

The finished thickness varied from ⅛- to ¼-inch. Calendered sheets were used, at times without ply cementing, although some manufacturers cemented all plies.

Spray coating was not practiced or contemplated.

Vulcanization

One manufacturer cured in air compressed to 90 pounds in steam-jacketed vulcanizers lined with steam pipes. Other manufacturers first turned 60 to 90 pounds of air into the heaters; then turned in steam to displace gradually part or all of the air through bleeding petcocks at the top.

All manufacturers cured to about half the finished cure, then blew down, and removed the tanks for testing the defects. This was done electrically using three amperes and 500 volts. After any defects found were repaired the tanks were returned to the vulcanizer to complete the cure. The actual curing times for the semi-cure and final cure were from four to six hours at temperatures ranging from 285° to 300° F.

Appearance

Most of the tanks, either finished or in process, did not have a smooth appearance, and the workmanship was generally rather ragged. The reason given was the lack of skill of the imported foreign labor.

Compounding

There was a wide divergence of compounding practices. While three manufacturers used hard rubber dust, one added polyvinyl chloride in powdered form to replace hard rubber dust. A less brittle finished lining was claimed.

Buna #32, a soft sodium polymerized butadiene rubber, and Buna 85, a potassium polymerized butadiene of higher molecular weight, were used extensively as processing aids. Tack was improved, and smoother calendered sheets were obtained. Both appeared to cure to some degree in hard rubber.

Brown factice was used by only one manufacturer.

The German claims made for the various compounds for acid resistance, concentrations, temperatures, etc., were of the same order, or perhaps slightly more optimistic than are made for linings in the United States.

Special Materials

Prior to the war, several tanks had been lined with polyisobutylene for nitric acid and oxidizing solutions. The P.I.B. was stuck to the tank with a bitumastic cement. Neither samples nor compounding details were obtainable.

Tanks for similar purposes were being lined with sheets of very stiff polyvinyl chloride. The material was received in sheets a meter wide and of three-millimeters thickness. Blocks were cut out with a band saw and fitted to assure that all seams would be butted exactly straight and tight. All of these pieces had to be cut accurately and almost force fitted. An extruded cove piece was used around all the tank edges, and the bottom and side sheets were butted against the cove. The sheets were then removed from the tank, and all abutting edges were slightly beveled. The tank was cemented with a bitumastic cement, and the cut pieces of polyvinyl chloride were replaced against this cement. A rod of the same material, extruded ⅛-inch in diameter, was melted into the adjoining beveled V-slots between sheets with a blow torch. Special extruded shapes were provided for the top flanges of the tanks.

Round tanks were lined by preforming heated cut sheets until they conformed to the shape of the tank and finished in the same manner as the square tanks.

Large-diameter metal pipes were lined by bending a preheated sheet and welding by blow torch to form a cylinder large enough

to fit snugly into the pipe. For lining smaller pipes, extruded cylinders of the material were forced into place.

It was stated that these were costly jobs, requiring a great deal of hand labor as skilled as cabinet makers. Because these tanks worked well with nitric and chromic acids, for chromium plating, etc., where nothing else would serve as well, they were being produced as standard items in fairly steady production.

TANK LININGS

	Continental Gen. Purpose	N. Y. Hamburger			
		Gen. Purpose	Abrasion Resistant†	Abrasion Resistant‡	For Hydrofluoric Acid	Base Cement
Buna S Defo 200	90.0					100.0
Buna S Defo 700				60.0		
Buna SS		77.0	90.0		70.0	
Buna 32	10.0	14.0	8.8			
Buna 85		9.0	1.2	40.0	30.0	
Factice-Brown		10.0	7.0	8.4	15.3	
Polyvinyl Chloride		26.0	12.5		23.0	
Tricresyl Phosphate				7.0		
Renacit*					2.4	8.0
Naftolen			7.6			
Koresin						25.0
Rosin					6.0	
Naphthalene		10.0	1.9			
Black—Channel			.3			
Black P-1250				14.0		
Black P-33 Type				28.0		
Hard Rubber Dust	50.0				59.0	
Graphite		15.0	3.8		12.0	
Kieselkreide*	14.5	110.0	52.0	36.0		
ZnO					2.0	3.2
P.B.N.	2.0				7.0	
Beschle 57*	.7					
MBTS				1.0		1.6
DPG				.6		
Vulkacit CTN*			3.2			
Sulphur	32.0	16.0	7.6	2.0	17.5	29.5

* See Appendix (at end of concluding installment).
† Pipe and fittings.
‡ Tank linings.

FRANZ-CLOUTH TANK LININGS

	Base Cement	Under Ply for Hard Top	Hard Top Ply†	Hard Top Ply‡	Mid Ply for Soft Top	Soft Top Ply§
Buna S Defo 200	42.0					
Buna S Defo 700	58.0		50.0			
Buna SR			50.0			
Buna SS Chemi*		47.5				
Buna 85		47.5				
Whole Tire Reclaim			62.5			
Smoked Sheet				23.5	100.0	50.0
Para Rubber				70.5		50.0
Polyisobutylene		5.0		6.0		
Korelen*		4.8	12.5			
Naftolen		9.6				
Stearic Acid			2.5	.25	1.0	.25
M. R.			5.0			
Rosin	5.4					
Black—Channel		.3			20.0	
Black P-1250					8.7	
Hard Rubber Dust				27.2		
Clay		64.0				
Graphite				1.4		
Whiting	22.0					
Kieselkreide*			62.5			
ZnO	154.0	3.0	2.5		10.0	3.2
MgO			5.0	1.4		
Red Coloring	3.2			1.4		
MBTS	3.2	1.2	2.5		1.0	
DPG				1.4	1.0	1.4
Sulphur	22.0	18.0	35.0	33.0	14.4	3.2

* See Appendix (at end of concluding installment).
† For HCl—HF—SO_2 H_2SO_4—H_3PO_3—H_3PO_4 NO_2—N_2O_3—N_2O_5 (10%).
‡ For HNO_3—HNO_3—25%—20° C. CH_3—CO_2H and all organic acids.
§ For abrasion resistance.

Mixing Procedures

Mixing methods for belt cover stocks follow closely that of tire tread compounds. Skims for belts and hose are mixed very much the same as tire carcass stocks. As a matter of possible interest, mixing procedures for tread and carcass compounds as shown in the report on German synthetic tires are outlined below.

1. Continental Tread Stock

BANBURY ROTOR SPEEDS—14 and 15.5 r.p.m. (decreased from former speed of 22 r.p.m. because of Banbury overheating).

COOLING WATER TEMPERATURE—13-14° C.

MASTER-BATCHES—(a) Buna S crumbs and Naftolen in 2 to 1 ratio mixed separately in Banbury. (For purpose of absorbing large quantities of softener for master-batch purposes. Continental preferred the crumb whenever available.)

(b) Buna S3 and Plasticator #32 in 3 to 1 ratio mixed in Banbury.

(c) Accelerator master of 10% Vulkacit AZ and 90% Buna SS.

BATCH SIZE—170.05 kilograms.

MIXING CYCLE

	Minutes
Buna S3, Buna S3 crumbs-Naftolen master, and Buna S-3-Plasticator #32 master Ozokerite V and Aktiplast	3
Black and other materials except Kakol and accelerator master	6
Kakol	4
Unloading time	1
Total	14

The batch is dumped on an 84-inch mill below the Banbury. Rolls set fairly open.

	Minutes
Batch passed once through completely and then put around roll and cut four times from each side. Time	12
Removed on automatic cut-off, cooled, dusted	2
Total	14

70.01 kilograms of this batch weighed out and put on first of a pair of 84-inch mills, set tight; so this weight of batch gives rolling bank. Stock cut continually back and forth for nine minutes, then cut and fed to second mill, which is directly back of first mill.

As soon as batch covers rolls, accelerator master added, and stock cut twice from either side. Sulphur added, batch cut twice from each side and end-passed three times.

	Minutes
Time on second mill	8
Remove in S. slabs and dust	2
Total	10

Finished stock is rested at least 24 hours before tubing.

To prevent overheating, speeds of 84-inch mills have been reduced from 30 meters a minute front roll, 33 meters a minute back roll (formerly used for natural rubber) to 22 and 24.75 respectively for Buna.

2. Phoenix Tread Stock

A 150-kilogram batch is mixed in a Werner Pfleiderer mixer.

	Minutes
Buna S Type 3 with the Rosin	2
Aktiplast and Koresin	3
Kautschol and Naftolen	3
Plasticator 32	5
Unloading time	2
Total	15
Transferred to 84-inch mill.	
Thoroughly worked	10
Batch taken off in eight slabs—air cooled	5
Total	15
After not less than eight hours, the batch, as mixed above, is placed in a Banbury and worked	8
Carbon black	10
Unloading time	2
Total	20
Transferred to 84-inch mill.	
Thoroughly worked	15
Batch cut off in ten slabs—water cooled	5
Total	20
After not less than eight hours, the master-batch as mixed above, is reweighed, and an amount sufficient to make a final batch weight of 50 kilograms is placed on the 84-inch mill and milled	2
Accelerators and PBN	4
Zinc	5
Sulphur	4
Batch-off time	5
Total	20

Note: Before master-batch is put on an 84-inch mill, it is given one pass through a cracker.

The stock is allowed to rest not less than 16 hours before tubing.

3. Dunlop Tread Stock

To illustrate Dunlop practice, there is given below the complete mixing procedure for the compound shown in the formula table which was used for treads for passenger cars and small trucks.

BLACK MASTER BATCH

Buna S-3 (Defo 700)	50.750
Reclaim	5.650
Zinc Oxide	2.050
CK-3 Black	32.200
Aktiplast	0.150
Paraffin	1.325
Softener WA3	2.125
Naftolen	5.300
PBN	0.450
	100

A 450-pound (200-kilogram) batch is mixed in the Werner-Pfleiderer mixer in 25 minutes as follows:

	Minutes
Buna reclaim	4
Softener WA3	4
PBN	1
Naftolen	7
Black—ZnO, Paraffin, and Aktiplast	7
Dump	2
Total	25

After dumping and cooling, the batch is passed once through a tight refiner requiring 35 minutes.

SULPHUR MASTER-BATCH

Buna S-3 (Defo 700)	60
Zinc Oxide	10
Naftolen	5
Sulphur	25
	100

A 130-pound (60-kilogram) batch is mixed in 40 minutes on an 84-inch mill as follows:

	Minutes
Buna mastication	5
Naftolen—add slowly	15
Sulfur and ZnO (mixed)	10
Cutting	5
Removing and marking	5
Total	40

ACCELERATOR MASTER BATCH

Buna S-3 (Defo 500)	77
Zinc Oxide	10
Aniline Red (for Color)	0.100
Aktiplast	2.900
MBTS	10
	100

A 120-pound (50-kilogram) batch is mixed in 31 minutes on an 84-inch mill as follows:

	Minutes
Buna Mastication	4
MBTS, Color, ZnO	10
Aktiplast	8
Cutting	5
Removing	4
Total	31

FINAL BATCH

Black Master	88.700
Sulphur Master	4.800
Accelerator Master	6.500
	100

A 110-pound (50-kilogram) batch is mixed in 12 minutes on an 84-inch mill.

4. Continental Part Crude Skim

Smoked sheets premasticated—150 kilograms—23 minutes—84-inch mill, then strained (most of rubber received recently has been very dirty).

BANBURY ROTOR SPEEDS—14 and 15.5 r.p.m.

COOLING WATER TEMPERATURE—13-14° C.

BATCH SIZE—190 kilograms.

MIXING CYCLE

	Minutes
Rubber, Buna S3	3
Black, zinc, accelerators	5
Kakol	7
Unload Banbury	1
Total	16

Dump temperature—126-128° C.

Batch is dumped on an 84-inch mill below the Banbury, allowed to pass through rolls once, then banded, cut four times from each side, and allowed to pass through the rolls completely. Time, 16 minutes, including two minutes for removal and dusting.

70.05 kilograms of this batch weighed out and placed on one 84-inch mill, worked back and forth, then after seven minutes working cut over to the second 84-inch directly in back. As soon as the whole batch is on mill B, sulphur is added, stock cut three times from each side, then passed through roll completely. Mixing time, six minutes, plus two minutes for removal.

5. Phoenix Skim Coat Stock

Mixer—Werner Pfleiderer Batch weight—200 Kg.

	Minutes
Buna S worked	4
HM-20* put in and mixed	8
Accelerator	2
Zinc and black	6
Naftolen added	8
Mixer emptied	2
Total	30

* HM-20 is a softener master batch of five parts Naftolen, four parts rosin, and one part Koresin.

	Minutes
Batch is transferred to 84-inch mill.	
Stock is thoroughly worked	25
Batch taken off in 12 slabs, water cooled	5
Total	30

Masterbatch is rested at least eight hours, and final batch size of 100 kilograms is mixed on 84-inch mill.

	Minutes
The masterbatch is given a pass through a very tight mill	2
Accelerator AZ is added, mixed	4
Sulphur mixed	4
Batch taken off in six slabs, water cooled	5
Total	15

(To be concluded)

Insulating Material Unaffected by Water

CELLULAR glass insulating material, produced for the first time less than two years ago, is expected to find wide application in the construction field after the war. It is completely and permanently unaffected by water. Known as Foamglas, its volume is about 15 times that of ordinary glass. It has a closed cell structure and contains about five million tiny sealed air pockets per cubic foot. The average weight of the material is about 10.5 pounds per cubic foot, about the same as cork. Because it is light in weight and completely impervious to water, it has found wartime use in heavy flotation equipment. As insulation, it has been used in many types of ship construction. Foamglas is non-combustible, vermin-proof, and will not absorb or give off odors. Hot caustic and hydrochloric acid are the only chemicals that affect it adversely.

The physical properties are as follows:

Weight	10.5 lbs. per cu. ft. average
K (Conductivity at 50° F.)	0.45 B.t.u./hr./sq. ft./° F./in.
K (Conductivity at 300° F.)	0.70 B.t.u./hr./sq. ft./° F./in.
Coefficient of expansion (s° F.)	.0000046
Specific heat	.16 to .19 B.t.u. per lb. per ° F.
Crushing strength	150 lbs. per sq. in. (average)
Modulus of rupture	90 lbs. per sq. in. (average)
Absorption (24-hr. immersion in water)	Average 2% by weight (all at surface)
Air infiltration or permeability	0
Volume change with moisture	0
Capillarity	0

Foamglas is produced in rigid slabs 12 by 18 inches in various thicknesses. For special dimensions or shapes the material is cut by hand or band saws, knives, or drills. It fabricates easily.

Alinement Chart for Tensile Strength of Rubber and Plastic Compounds

Donald F. Othmer[1] and John G. Harrison, Jr.[1]

IN THE last 75 years, which period marks the scientific study of the physical properties of rubber, tensile strength and relation of strain to stress have probably received more attention than any other physical characteristics. The fundamental knowledge gained by such studies has been a major contribution in research, control, and development of new materials. The ease of measurement and reproducibility under standardized conditions place the test for these properties as a major tool in the rubber and plastics industry.

Test samples prepared according to the A.S.T.M. Specifications, D412-41 Method of Testing of Vulcanized Rubber, will have varying thicknesses according to variations in amount of stock added to the mold, plasticity, vulcanizing temperature, etc. The dumbbell shaped strip cut by a die has standard end sections to be gripped by the jaws of the testing machine. The central section for breaking is 0.25-inch wide for the A.S.T.M. die B or C. The thickness is measured with a micrometer; and the stress necessary to break is determined on the machine. The relation of the variables is given by the formula:

$$T = 4\ M/G$$

where "T" is equal to tensile strength in pounds per square inch; "M" is machine reading in pounds, and "G" is the gage or thickness of the sample in inches.

The equation is most frequently solved by a slide rule. Various tables have been prepared, such as that of the Wilmington Chemical Corp.[2] Where many samples are being tested regularly, a nomogram would be more quickly used than the slide rule and would allow a better interpolation of intermediate values than the tables.

Owing to the wide ranges it was necessary to devise a nomogram with extremely long scales in order to obtain the desired precision in use. The basic form is that of the three-parallel alinement chart for multiplying and dividing; but in order to compress the very long scales for machine reading and tensile strength into a reasonable space, they have been broken into four parts each. The finished nomogram is indicated in the attached figure; and it is only necessary to remember in using it that the Scale A for machine reading must be used with Scale A_1 for tensile strength, Scale B must be used with Scale B_1 etc. Thus there are really four nomograms for the four different ranges with each using the same scale for the sample thickness.

In use, a straight line is drawn from the left-hand scale representing sample thickness through the value of the observed machine reading on one of the scales and extended to the corresponding tensile strength scale where the value of the tensile strength is read directly.

The arrangement of tensile strength lines to include a logarithmic cycle makes calculations possible where the tensile strength is lower than 460 pounds per square inch or higher than 4600 pounds per square inch. In such cases decimal multiples of machine readings are used, and the tensile strength is shown as the corresponding decimal multiple.

For instance, many stocks, particularly at small elongations, will have modulus values lower than is shown on scale D'. Likewise, some stocks will have tensile strengths lower than the 460 pounds shown at the bottom of scale D'. To calculate the tensile strength of a strip which gaged 0.060-inch and broke at three pounds, it is necessary to use a fictitious value of 30 pounds on scale C. The chart will show a tensile strength on scale C' of 2,000 pounds. The correct tensile strength in this case for a machine reading of three pounds is 200 pounds instead of 2,000 pounds.

In like manner, if a strip 0.060-inch thick broke at 75 pounds, it is necessary to use the fictitious value of 7.5 pounds on scale D, which will show a tensile strength on scale D' of 500 pounds. The correct tensile will be 5,000 pounds instead of 500 pounds. It should be noted that no errors can be made by finding other results. The points for 75 pounds on scales A and B do not line up with 0.060-inches gage to show any tensile strength points.

(*Chart appears on page opposite.*)

[1] Polytechnic Institute of Brooklyn, Brooklyn, N. Y.

[2] "Tensile Strength Table," K. S. Rostler and H. J. du Pont, Wilmington Chemical Corp., Wilmington, Dela., Dec., 1943.

Recent Russian Literature

(*Continued from page 78*)

impression of a large deformation set. Rod-polymerized rubbers attained three-quarters of their maximum strength after the first 2-3 minutes of vulcanization. Beyond this time the rise of strength was rather slow. Polydiene rubber is not suitable for thermal vulcanization.

The effect of inorganic additives on the rate of vulcanization was studied on rod polymerized rubber to which was added 2.5% of CaO, 2.5% of NaOH, or both. NaOH shortens the time of curing considerably, but affects adversely the elasticity. CaO is less effective in shortening the curing time than NaOH, but it does not lessen the elasticity. Best results in this respect are obtained when both NaOH and CaO are added to the mix. Raising the temperature also shortens the curing time, although curing at a higher temperature (250° C., 482° F.) beyond a very short period converts the rubber to an ebonite-like product.

(*To be continued*)

Reports from India and Malaya

India is receiving synthetic rubber under lend-lease from the United States in return for crude rubber, and technicians are understood to have been sent to America and England to learn how to process the synthetic rubber.

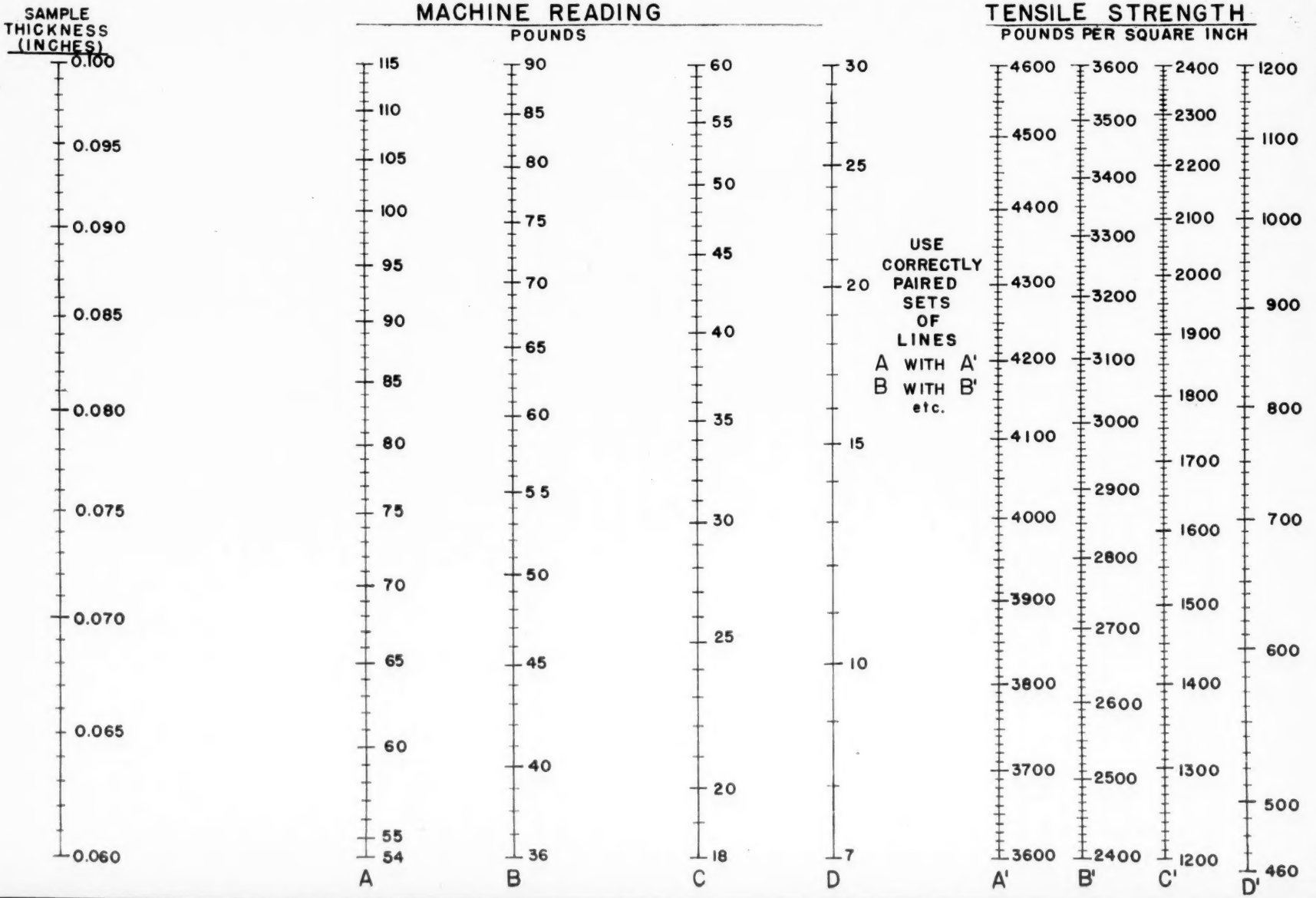
Exports of crude rubber from India in 1944 totaled about 8,000 tons, most of which went to the United States.

Among the different rubber goods now being manufactured in India are rubber soled shoes, of which increasing quantities are coming on the market. The present annual production of this footwear is said to be about 14,000,000 pairs.

From time to time news has been received of different members of the staff of the Rubber Research Institute of Malaya, indicating that some were able to escape to Ceylon and other British countries, though others were less fortunate. Recently it was learned that two members of the Institute, F. Beeley and E. E. Pyke, died in Thai Camp in 1943. Mr. Beeley had for some years been associated with the Institute as head of the pathological division.

Rubber plantations in Malaya have on the whole not been seriously damaged, Air Marshall Sir Philip Joubert, deputy of staff to Lord Louis Mountbatten in Southeast Asia, stated in London on August 20 on the basis of information he had received. He had been informed, he said, that part of the plantations had been cut down to make way for the production of food, but apparently the bulk of the estates is intact, and rubber should be coming out of Malaya soon.

ALIGNMENT CHART FOR TENSILE STRENGTH OF RUBBER COMPOUNDS



EDITORIALS

American Rubber Institute Needed Now

DURING the past few weeks your editor has had the opportunity to talk at some length with the directors of research of the French and British natural rubber producers' associations and to learn to some extent, at least, the scope of the research work that has been carried on by these associations, even during the war years. Admittedly the work carried on in France could not be on so broad a basis as that carried out by the British Rubber Producers Association, but according to recent communications from the Rubber Foundation in Holland the work done there between 1942 and 1945 has been quite comprehensive.

It is a foregone conclusion that the research organizations in these three major natural rubber producing countries will broaden the scope of their research activities in the postwar period. They all realize that with the tremendous growth of the American synthetic rubber industry during the war, they now have an added problem of improving natural rubber for its future competitive battle with synthetic rubber. Cooperative research on synthetic rubber under the direction of the Rubber Reserve Co. was carried out in this country during the war, but this research was more concerned with projects dealing with the fundamentals of the chemical mechanisms of the reactions involved in the various processes presently being practiced in order to improve the control of process variables and product quality. Some exploratory work has been conducted toward the development of new types of synthetic rubber, but according to a recent statement of S. T. Crossland, the research and development activities of the Office of Rubber Reserve will continue only for the next six to twelve months. Actually with the background of the work done during the war years, the greatest progress in research on synthetic rubber and on natural rubber as well, should be made in the next several years.

It is at this point that some of the remarks made by N. A. Shepard, chemical director of the American Cyanamid Co., at the occasion of the dedication of the Goodyear research laboratory in June, 1943, are repeated because they appear to the editor of INDIA RUBBER WORLD to be even more pertinent now than then.

Speaking of the government's research program as it was being carried out in 1943, Dr. Shepard said:

"The writer's concern is not over the comprehensiveness of the research program, but with what happens to the incompleted researches after the unconditional surrender of the Axis Powers. Shall the investigators stop in their tracks and leave promising and partly solved problems in mid-air, after all the scientific effort and large appropriations that have been expended? Shall the cooperation on the fundamentals cease, each company independently conducting its own research program, and will such programs be confined largely to the immediate factory processing and improved and new product research?

"It is the ardent hope of the writer that this industry cooperation will not stop, but that provision will be made whereby it can and will be continued. Under government auspices? No! In a Rubber Institute supported preferably by the entire industry, but if not by all, by the larger companies, and those smaller companies which have managements with the vision to join in the effort! Few, if any, of the large units of the Rubber Industry can afford alone to support the type and amount of fundamental research now being done under government auspices. In the writer's opinion, a laboratory, even such as this new Goodyear laboratory, must confine its activities to the more immediate problems of the company—the competitive research imperative to keep the company abreast of and 'out-in-front' in the industry. There should be no cooperation on this type research; it is the life blood of the company and its insurance policy.

"But the fundamental research! There should be an Institute, ably headed and directed, with adequate laboratory facilities and personnel and an ample budget enabling it to let out contracts to industrial laboratories, universities, and private institutions where these have personnel and facilities better suited for attacking a problem. Funds could be provided by the participating companies, the assessment being pro-rated on the basis of pounds of rubber processed by each."

Dr. Shepard said in June, 1943, "The Rubber Industry has an opportunity right now which is not likely to present itself again in the near future."

Fortunately "now" still means until about July, 1946, according to the above-mentioned statement of the head of the Office of the Rubber Reserve. The recently formed Rubber Industry Advisory Committee of the WPB might be one of the best places for the discussion and decision regarding the formation of an American Rubber Institute, and the subject should certainly be on the agenda of the next meeting of this Committee.

Management-Labor Bargaining

IT WOULD seem to be a good suggestion that some of the difficulties in the settlement of the current wave of disputes between management and labor, which seriously threaten rapid reconversion of industry, might be eliminated if both parties would honestly accept one of the definitions of the word "bargain" given by Webster and not to follow so closely another definition given for this same word.

The definition that seems to describe aptly most of the present "bargaining" is given as: "To negotiate over terms of an agreement; to haggle." The definition that contains the better suggestion as to how "bargaining" should be carried out states: "To make a contract for the exchange of property or services; to come to terms."

Scientific and Technical Activities

Development of German Chemical Industry as Reported by the C.W.S.

PRIOR to the landing in Normandy, the Chief of Chemical Warfare Service, Washington, D. C., had organized a group of military and civilian investigators to make a thorough examination of the enemy's progress in chemical production and research during the war years. The main concern of the investigation was the production of finished military products and reporting those developments which might then accelerate production of such products in this country for the remainder of the war. Following V-E Day these teams working directly under the SHEAF proceeded to collect first-hand information concerning German chemical activities during the war. The work is still in progress, and as the gathering together and sifting of all available information will take a considerable amount of time, it has been deemed advisable to release a preliminary report covering important findings.

Owing to extreme shortages in raw materials, the Germans spent most of their available energy on finding substitutes. Although some of the substitute materials made by the Germans appear to be spectacular, it is a fact that the German chemical industry was far inferior in comparison with its American equivalent, especially as far as quantity and volume of production are concerned. Certain specific developments stressed in Germany are of little more than scientific interest in the United States as some of the specific German shortages of raw material did not exist in America.

Synthetic Rubber

In the field of synthetic rubber the Germans developed a few new and different approaches to the final product, but here again this development was necessitated by extreme shortages of "starting materials" which did not exist in this country.

Acetylene, which is, incidentally, the starting point in the production of chloroprene synthetic rubbers, occupied an extremely important place in German chemical industry and research. This overemphasized position of acetylene was due to the serious shortage in the Reich of short-chain hydrocarbons, which are obtainable by cracking petroleum. While most of the acetylene was made according to the conventional methods from calcium carbide, one large German plant at Huls used the arc process utilizing waste gas from coal hydrogenation, natural gas, or coke oven gas residues after passing these residues though the Linde process.

While many of the processes used by the Germans are already familiar from the patent literature, it is of particular interest to note the extent to which these processes had been developed. The Germans, for instance, made butadiene from acetylene either via the acetaldehyde-aldol route or via the formaldehyde-acetylene (butine diol) route to conserve acetylene.

By working out safe conditions for the handling of acetylene under pressure, I. G. Farbenindustrie freed the chemistry of acetylene from the limitations imposed by the hazards involved in high-pressure work and was able to raise the vinylation reaction to a status comparable to sulphonation or nitration. Using a zinc (or cadmium) catalyst, I. G. Farben was able to vinylate ring substituted phenols. Vinyl iso-butyl phenol, known under the name, Koresin, was produced in this manner and was of great importance as a softener in the German synthetic rubber industry.

Buna was produced in a number of grades known as S, SS, SR, etc. Production generally followed conventional lines involving the copolymerization of butadiene and styrene. However, the lack of starting materials forced the Germans to find specific modifications. The lack of fatty acids resulted in the extensive use of a synthetic emulsifying agent (Nekal), and only 1% of the required emulsifier consisted of the alkaline salt of a fatty acid. Potassium persulphate was used as an activator, and di-isopropyl xanthogenate as a chain modifier. The polymerization, controlled through the use of phenyl beta naphthylamine, was carried out in a series of six steps using the reactors in cascade fashion. After the recovery of the unreacted monomers coagulation was achieved in two separate steps with a mixture of calcium and sodium chlorides and then with acetic acid. The coagulate was passed through a fourdrinier-type paper machine where it was drained, then squeezed through the rolls, dried in a four-compartment drier, and reached the market in neat 50-kilogram rolls. Despite the clean and neat appearance of the final product, the German Buna S seems to have proved inferior to that produced in the United States. Specifically the German product appears to lack uniformity of quality.

Butadiene was produced by a cumbersome synthesis from acetylene through the following steps:

(1) Calcium carbide → acetylene.
(2) Acetylene formaldehyde → butine diol.
(3) Butine diol → butane diol.
(4) Butane diol → tetrahydrofuran.
(5) Tetrahydrofuran → butadiene.

Tetrohydrofuran is an intermediate produced in the dehydration of butane diol which was not always separated; steps (4) and (5) were combined. An alternative method also in use was to pass from acetylene to acetaldehyde and then to aldol, butylene glycol and butadiene. Styrene was produced according to the conventional methods. Ethylene for this process was obtained either from ethyl alconol or through the hydrogenation of acetylene.

There seems to have been very little Perbunan produced in Germany. The production of Buna SS and SR appears to have been on a very small scale. No evidence has been found indicating commercial production of neoprene in Germany.

Polyethylene (German trade name Lupolen) was produced in two grades, one of the molecular weight 3,000 with low viscosity, and the other of molecular weight 15,000 and high viscosity. The ethylene was polymerized at 2,000 atmospheres with oxygen as a catalyst to yield the material of high molecular weight, and at 30 atmospheres in an alcoholic solution with a benzoyl peroxide catalyst to give the low molecular weight material. Polyethylene mixed with Oppanol (polyisobutylene) gave a product that could be milled and calendered readily.

Polyisobutylene, was obtained by mixing isobutylene with ethylene and polymerizing on a belt conveyer using 1% of boron trifluoride as a catalyst. The temperature was kept below —100° C. by allowing the ethylene to evaporate. As the conveyer was totally enclosed, the ethylene was recovered, recompressed, and reused. Although Oppanol alone cannot be vulcanized, if mixed with 1% butadiene or with some unpolymerized isobutylene, it can readily be vulcanized. In this manner it was used for cable insulation.

This is then a brief picture of the developments in the field of synthetic rubber in Germany during the war as reported by the Industrial Intelligence Staff, C.W.S., as part of its report on the German chemical industry. It is readily evident that the American industry was far ahead of that of the Reich and that despite a few amazing and new approaches to the manufacture of synthetic rubber, the Germans were unable to equal American production from the point of view of quality as well as particularly from the angle of uniformity of production and quantity.

Plastics

Nearly all the new developments in plastics were expansions of polymers at least known before the war. An example of a new field of polymers was the polyvinyl pyrrolidones made from gamma butyrolactone, ammonia, and acetylene. This field was still very much in the embryonic stage. The uses of these polymers, which in some ways physically resemble albumen, may not parallel those of the older plastics as is evident from the employment in the blood substitute Periston.

A class known before the war, but which has undergone great development is that of the polyurethanes produced by the reaction of di-isocyanates with polyalcohols. Linear polymers, such as Igamid two, produced from 1.6 hexamethylene di-isocyanate and 1.4 butanediol, can be both injection and compression molded. The products have good mechanical strength and electrical properties and very low water absorption. Fibers and bristles can be made by hot melt spinning and stretching, and leather substitutes, by sheeting. Other linear polymers furnish plywood adhesives more elastic than phenolics. When alcohols with more than two functional groups were used, infusible polymers were produced which make coatings of great weather resistance and very impervious to gases.

As might be expected from the fact that acetylene had become the building block for so much of the German aliphatic chemical industry, the vinyl plastics were greatly expanded. Polyvinyl acetate and the polyacrylates were running a race, with cheapness favoring the former, and quality the latter. A new and cheap process of producing acrylic acid in one step from acetylene promised to intensify the competition. In general, all methods of polymerization, mass, solvent, emulsion, and suspension, were in use, and not only were many different types of products made depending on conditions of polymerization, but the possibilities of copolymers were fully utilized. The vinyl polymers were used for surface coatings, glues, paints, food preserving, safety glass, cloth impregnation, artificial leather, and extended tubing. The vinyl

acetals had not been developed as much as in the United States owing to the smaller market for safety glass.

Unplasticized polyvinyl chloride stabilized with phenylindol had a large use for molding, sheets, tubes and stretched films. Much of the first three forms was used for chemical equipment, and the films were employed for packaging and insulation. Development was under way for continuous calendering machines. The plasticized product was used for wire insulation, fabric coating, shoe soles, raincoats, shower curtains, and fibers.

After-chlorinated polyvinyl chloride does not seem to have made much headway, but copolymers of vinyl chloride and methyl acrylate and particularly of diethyl maleate were growing in importance. Vinyl carbozole and vinyl benzoate were new compounds, but both proved of little commercial interest. The great demand for styrene for synthetic rubber slowed its development as a plastic.

There was little new in the phenolic and urea classes of thermosetting resins. In the melamine field, a new type was produced by reacting benzonitrile with dicyandiamide and condensing the resultant product with formaldehyde as usual. Such resins give lacquers with good gloss and better heat stability than the ordinary melamines.

Textile Fibers

The chief development in textile fibers during the war period was the introduction of the polyurethanes as new textile fibers. The most important combination used was hexamethylene di-isocyanate with butanediol 1:4. The polyurethanes were considered equal to nylon in most respects and superior in water absorption and dyeing characteristics. The polyester type was also made, and the I.G. polyamide type from 5-aminocaproic acid (5-caprolactam).

Much work was done on the improvement of the process for making cellulose acetate and regenerated cellulose, particularly to reduce usage of acetic acid by using solvents, and to speed up the viscose cycle. The polyurethane intermediate, hexamethylene di-isocyanate, and other di-isocyanates were also used to produce a surface-treated, water-resistant viscose rayon. The cuprammonium process was also greatly improved as regards both ammonia and copper recovery; the latter was done cheaply and almost quantitatively so that in cost this process was considered comparable with the viscose route.

Special acid and chemical resistant fibers were woven of polyvinyl chloride (chlorinated and unchlorinated) and also of polyethylene fibers.

Ontario Section Meeting

THE first meeting of the Ontario Rubber Section of the Chemical Institute of Canada is scheduled for the Chemistry Bldg., University of Toronto, Toronto, Ont., on October 25 and will be preceded by a dinner to be held in Hart House. The speaker of the evening will be G. Benson, director of plant research, Shawinigan Chemicals, Ltd., Shawinigan Falls, P. Q., who will talk on "Acetylene Black in Rubber." The address will outline the methods of manufacture and properties of acetylene black and laboratory tests on its behavior in natural rubber, GR-S, and GR-I. Some new electron micrographs will also be shown.

Thiokol Technical Club Hears B. R. P. R. A. Head

THE Thiokol Technical Club of the Thiokol Corp., Trenton, N. J., held a very interesting meeting on September 26, at which the speaker was J. Wilson, research director of the British Rubber Producers' Research Association. His talk, which included a brief summary of the history and purpose of his organization and a discussion of some of its latest research work, was enjoyed by members of the Thiokol Club and a large number of invited guests. A. E. Laurence, who presided, introduced Mr. Wilson.

Mr. Wilson first explained that the B. R. P. R. A., which was organized shortly before World War II, was sponsored and financed by the Rubber Regulation Committee to work with research groups of other natural rubber producers such as Holland and France. He emphasized that fundamental research work on rubber was not abandoned during the war. The objective of his organization was to find out by use of the best scientific knowledge and techniques available the basic reasons for the characteristics of natural rubber such as its elasticity, plasticity, and aging so that when it was definitely determined why and how rubber acted as it did, the problem of improving natural rubber would be thoroughly understood. With the tremendous growth of the synthetic rubber industry, Mr. Wilson stated that he now had an added objective: to improve natural rubber for its future competitive battle with synthetic rubber. He said he hoped to accomplish this by making it possible for the natural rubber producers to provide modified rubbers with enhanced electrical, aging, and oil resisting properties for direct competition with the special-purpose synthetic rubbers.

Some of the most recent work of one of the Association workers, J. Bolland, on the mechanism of the oxidation of ethyl linoleate, was described by Mr. Wilson.

An abstract of this part of Mr. Wilson's talk, which described one of the abovementioned papers follows.

Dr. Bolland studied the thermochemical oxidation of methyl oleate, methyl linoleate, ethyl linoleate, and squalene; the idea was to gain a clear picture of the kinetics of these reactions preparatory to a study of the kinetics of the oxidation of rubber.

The material first studied was ethyl linoleate. Dr. Bolland was able to show that the oxygen entered the molecule as a hydroperoxide and that owing to resonance a pure conjugated hydroperoxide was obtained according to the reactions listed:

$$CH_3(CH_2)_4CH{=}CH{-}CH_2{-}CH{=}CH(CH_2)_7COOEt \rightarrow$$
$$-CH{=}CH{-}\overset{X}{C}H{-}CH{=}CH{-} \rightarrow$$
$$-\overset{X}{C}H{-}CH{=}CH{-}CH{=}CH{-} \rightarrow$$
$$CH_3(CH_2)_4CHOOH{-}CH{=}CH{-}CH{=}CH(CH_2)_7COOEt$$

It was found that the rate of reaction was dependent on the oxygen pressure until an appreciable amount of hydroperoxide was formed. After that stage, however, the reaction rate was independent of oxygen pressure and directly proportional to the peroxide content. It was also found that the reaction rate was directly proportional to the concentration of linoleate, and the temperature dependence of the reaction was studied with the object of obtaining the overall energies of activation. Dr. Bolland was able to show that the reaction involved free radicals and could be formulated in the following series of kinetic steps:

INITIATION

$$2RH + O_2 \xrightarrow{K_1} R^X +$$

PROPAGATION

$$R + O_2 \xrightarrow{K_2} ROO^X +$$
$$ROO^X + RH \xrightarrow{K_3} ROOH + R^X$$

TERMINATION

$$R^X + R^X \xrightarrow{K_4} R{-}R$$
$$R^X + ROO^X \xrightarrow{K_5} ROOR$$
$$ROO^X + ROO^X \xrightarrow{K_6} ROOR + O_2$$

An examination of these reaction steps showed them to be in agreement with the experimental evidence. No other series of reactions could be found that were in agreement with the experimental results. Finally, Dr. Bolland studied the effect of using benzoyl peroxide as a catalyst since the decomposition of this material is a monomolecular reaction, and, as expected, it was then found that the rate of oxidation was now proportional to the square-root of the peroxide concentration. As a result, he felt sufficient confidence in the formulated scheme to calculate the various energies of activation, and then he went on to show that the reactions suggested were not inconsistent with the calculated heats of reaction.

Since the various reactions may proceed simultaneously in any one of several directions, very complex end-products are possible. For instance, the free radical R may not necessarily attack oxygen. It may attack an ethylenic bond thereby giving rise to polymerizates.

$$R^X + CH_2{=}CH_2 \rightarrow RCH_2{-}\overset{X}{C}H_2 \sim\sim$$

Alternately the ROO^X group may attack a conjugated ethylenic system, thus forming peroxidic polymers.

$$ROO^X + CH_2{=}CH{-}CH{=}CH_2 \rightarrow$$
$$ROOCH_2{-}CH{=}CH{-}\overset{X}{C}H_2 \rightarrow$$
$$ROOCH_2{-}CH{=}CH{-}CH_2OOR$$

Another interesting point which resulted from this work was the discovery that antioxidants function by stopping the oxidation chain. In fact, one molecule of peroxide is destroyed for each molecule of hydroquinone that disappears, when this latter material is used as an antioxidant.

In the discussion which followed Mr. Wilson's talk he emphasized that the oxidation of synthetic rubber could not follow the same course as the oxidation of natural rubber because of the lack of a regular conjugated system of structure in synthetic rubber. The mechanism of the swelling of natural rubber in oil and probable reasons for the value of the German material Koresin, when used as a tack producer with GR-S, were also discussed.

Record Attendance at New York Group Meeting

ATTENDANCE at the September 21 meeting of the New York Rubber Group, at which three members of the WPB-FEA Enemy Technical Reports Committee described some of their findings and experiences during their recent trip through German rubber plants, taxed the capacity of the Building Trades Club, 2 Park Ave., New York, N. Y. A. H. Nellen, Lee Rubber & Tire Corp., discussed the "German Synthetic Rubber Tire Industry"; R. A. Schatzel, Rome Cable Corp., described "German Synthetic Wire and Cable"; and W. L. White, Manhattan Rubber Mfg. Division, Raybestos-Manhattan, Inc., talked on the "General Synthetic Rubber Situation in Germany." Following dinner a film entitled "Mining and Milling of Asbestos Fibers" was presented with a descriptive talk by Simon Collier, of Johns-Manville Corp. Harry E. Outcault, chairman of the Group, presided and introduced the various speakers.

The German Tire Industry

Mr. Nellen before beginning his talk showed some slides made from photographs he had taken during his stay in Germany which portrayed the heavy damage the German plants had suffered from bombing. One of these slides, showing the condition of the Continental plant in Hannover, has been reproduced in the accompanying illustration. This speaker then said that since technical reports which cover in considerable detail the various phases of the German rubber industry have been widely circulated from government agencies in Washington, he would in his talk attempt to answer some of the questions that had been asked him repeatedly since his return from Germany.

In reply to a question on the attitude of the German technical rubber men toward the American and British investigators and whether or not they were giving accurate information, Mr. Nellen said that the German technical men and factory executives whom he contacted were cooperative and friendly. They were relieved and happy to know that the many months of ceaseless bombing were over, and their ambitions had been reduced to such elemental ones as getting food to eat, shoes and clothing to wear, a room with a roof in which to live, and possibly to obtain a permit to ride a bicycle. Also, they realized that they were completely beaten and knew that the one possible way to get their rubber factories in condition to run again was by means of American and British assistance. As to the accuracy of the information obtained, it was certain that the information in the WPB-RFC reports was reliable and accurate since it had been cross-checked and verified from actual formulae and manufacturing specifications and also by checking samples of products and inspecting manufacturing equipment.

Regarding a question whether or not the German technical tire men were unusually capable, Mr. Nellen said that he found them capable in a dull, methodical sort of way, but that none of these men seemed to him to have any unusual genius or ability. The personalities, positions, and abilities of several of the leading German rubber executives, chemists, and engineers were then described.

The question as to how well the German tire manufacturers liked their Buna rubber was next considered. The tire manufacturing men considered the newer Buna S-3 superior to the original Buna S from the standpoint of workability, tack, and general physical qualities, but they rated even this S-3 as strictly a poor imitation of natural rubber, it was said. The reason for making the original rubber tough and then softening it with heat was that the German research chemists, particularly those connected with I. G. Farbenindustrie, were of the firm opinion that the best-quality products could be made by following this procedure. Some of the factory chemists agreed with this point; while others had advocated a softer rubber which did not require heat softening, but, in general, the factory chemists and engineers were resigned to taking whatever I. G. gave them and doing the best they could with it.

Regarding German workmanship, Mr. Nellen said that judging from finished products on hand in the plants and some semi-finished tires and tubes remaining in the manufacturing departments, the workmanship was classed as very poor. Foremen of the plants blamed this condition on the slave laborers they had to use.

The German chemists and engineers were not in favor of retaining much production of synthetic rubber in Germany, even if they had won the war, and were anxious to return to the use of natural rubber in tires and tubes just as soon as it was possible to do so. Regarding synthetic fibers, however, the Germans were using rayon cord in all of their tires, and they indicated that they preferred to continue with rayon cord in both truck and passenger tires whether or not cotton cord again became available.

As to what was learned about tire manufacturing in Germany that would be helpful to the American industry, Mr. Nellen averred that not much was learned from the German industry that is useful to us. It was, felt that their material, Koresin, might be helpful in improving the tack of GR-S compounds and their Plasticator 32 might possibly be used as an efficient softener. Attention was also called to certain advantages of the German Manchetta valve used in tire curing bags.

In replying to a final question on the success of the Technical Rubber Mission to Germany, Mr. Nellen said that he believed that the Mission was an unqualified success, since all of the factories on the schedule were reached, and the very best and most outstanding men of the German industry were interviewed. All the "know how" these men possessed was obtained, and, finally, the Mission dispelled for all time any possible idea that, from the standpoint of the rubber industry at least, there were any "supermen" in Germany, he concluded.



Bombed-out Section of Tire Plant of Continental Gummiwerke at Hannover

German Synthetic Wire and Cable

Mr. Schatzel, in discussing German synthetic wire and cable, first dealt with the extent of bomb damage to the plants manufacturing these products. Departments containing mostly light equipment were pretty badly wrecked, while those which employed heavy equipment were not in such bad shape. In the later category the rod mills and wire drawing mills were reported to be in fair shape in most of the plants visited.

The longitudinal or strip covering process was used universally for insulating small sized wires while jacketed cables were extruded. Production efficiency was much lower than that in American plants.

Natural rubber had not been used for cable insulation for several years, and the Germans did not consider either natural or synthetic rubber satisfactory for insulating wires used to carry more than 3,000 volts. With the use of Koresin and naphthalene, wire and cable manufacturers were able to calender accurately and regularly synthetic rubber sheets of 15 mills thickness, which was considered to be one of the outstanding achievements of the German wire and cable industry.

Polyvinyl chloride insulation was used extensively in Germany for low-voltage flexible cables. Some Perbunan oil-resistant jackets had been made, and U-boat jacket cables had been manufactured from a mixture of Perbunan and methyl methacrylate (Plexigum). Mr. Schatzel declared.

German Mechanical Goods and General Situation

Mr. White prefaced his remarks with comments that since he had known many of the leading technicians and executives of the German rubber industry from his visits to Germany ten or more years ago and from the visits of these men to the United States in the late 1930's, he was most anxious to see what improvements they had made in their synthetic rubber, their compounding, and processing techniques. He said it was true that they had more polymers, but most of them were still hard and difficult to process. No new and outstanding compounding ingredients, except possibly Koresin, had been developed, and the same accelerators were still in use. Some progress in processing had been made with the heat softening method of plasticizing Buna S, which, he said, in his opinion might have certain advantages. The speaker emphasized that the German technician is not so production minded as we are and is more interested in perfection rather than in high production rates.

It was explained that much less cooperation existed between the manufacturers of and users of synthetic rubber in Germany as compared with the United States. I. G. Farben provided the formulae and processing procedure, and if the factory chemist objected to the resulting reduced production rates, it was pointed out to him that I. G. had showed him how to produce products with Buna S that would be superior to natural rubber, but that if he did not follow the instructions, the responsibility was his, and that he might be required to explain any failure of his products to a very high government authority. In spite of all this, most of the German

rubber products were of inferior quality and would not be tolerated in the United States, Mr. White stated.

It was pointed out that very little new development had been carried out because of the difficulties of even keeping plants running under the conditions of war and repeated bombing.

Program of November Meeting

At the meeting of the New York Group, to be held at the Building Trades Club, November 2, the chief speaker will be Verne L. Smithers, of Akron, O., who will talk on "The Application of High Frequencies to Heating and Vulcanizing Rubber," in which he has been and is doing much experimental and research work. Another speaker will be T. P. Kinn, supervisor of industrial electronics of the engineering department of Westinghouse Electric Corp. The meeting will start promptly at 4 p.m., to be followed by dinner at 6:30. The speaker after dinner will be "Sunshine Gene" Flack, director of advertising of Loose-Wiles Biscuit Co. and president of the Sales Executives Club of New York, who enjoys a national reputation as a forceful talker.

Faull Addresses Boston Group

THE fall meeting of the Boston Rubber Group was held at the Copley Plaza Hotel, Boston, Mass., September 28, with a very large number of members and guests in attendance. The speakers for the evening were J. H. Faull, Jr., technical director of the Government Synthetic Rubber Plant at Baytown, Tex., which is operated by the General Tire & Rubber Co., with General Latex & Chemical Co. as associate, who spoke on the "GR-S Black Masterbatch Process," and Cedric Foster, radio commentator and news analyst, who spoke on "37,000 Miles through the Pacific War Zones and the Peace to Come." Harry A. Atwater, chairman of the Group, presided and introduced the speakers.

Dr. Faull stated in his opening remarks that since August, 1944, the Baytown Synthetic Rubber Plant has produced 50 million pounds of GR-S Black Masterbatch. It was pointed out that for many years the rubber industry had considered the advantages that might be gained if the compounding process could be simplified by introducing compounding ingredients into rubber latex at the plantations. Economic and technical difficulties prevented the successful commercial realization of these advantages, but when the GR-S program began to take shape in 1942, and with operations contemplated in the Gulf area for the production of large quantities of synthetic rubber latex near the source of much carbon black production, several private interests participating in the government synthetic rubber program began seriously to consider the prospect of master-batch compounding of GR-S with carbon black. Dr. Faull then reviewed the anticipated advantages that had satisfied the Office of the Rubber Director to sponsor the construction of facilities for the production of GR-S Black Masterbatch at the Baytown plant operated by General Tire and General Latex and an Akron plant operated by the Firestone Tire & Rubber Co. He explained how most of these advantages, such as reduced processing time in rubber fabricating plants, reduced cold flow of the finished synthetic rubber making for easier packaging and warehousing, and opportunities for providing many new types of GR-S because of the improved handling of the final bulk rubber after the incorporation of the carbon black, had been or were rapidly being realized.

The new process was explained in some detail, and the results of many tests to verify the improved processability, better uniformity, and equal or better quality of finished rubber products made from GR-S Black Masterbatch were given. Some of the promising variations from the standard master-batch were also described, and Dr. Faull concluded by stating that the process has now been well established on a volume basis and should continue to grow in interest to manufacturers of rubber products both as the standard material and more particularly because of the new types now becoming available.

Mr. Foster in his very interesting talk described his experiences with the Army and Navy in the various operations against the Japanese during the period from May to August of this year, which led to the end of this war on August 14. He emphasized the tremendous scope and value of air power as well as the many hardships and sacrifices undergone by the naval personnel who manned our ships and the G. I.'s and Marines who slugged it out with the Japs on land. In conclusion he stressed the necessity of the combination of our War and Navy departments and of a new government department headed by an executive of Cabinet rank, as Secretary of Industry, in order to provide better coordination in the event of future world conflicts.

CALENDAR

Oct. 2.	Los Angeles Rubber Group, Inc., Mayfair Hotel, Los Angeles, Calif.
Oct. 12.	Chicago Rubber Group, Morrison Hotel, Chicago, Ill.
Oct. 24-25.	National Association of Waste Material Dealers, Inc. Fall Convention. Hotel Sherman, Chicago, Ill.
Oct. 25.	Northern California Rubber Group.
Oct. 25.	Ontario Rubber Section, C.I.C. University of Toronto, Toronto, Ont., Canada.
Oct. 29-30.	American Management Association. Production Division Conference. Palmer House, Chicago, Ill.
Oct. 29-Dec. 8.	Victory Loan Drive.
Oct. 30.	Detroit Rubber & Plastics Group, Inc.
Nov. 2.	New York Rubber Group. Building Trades Club, 2 Park Ave., New York, N. Y.
Nov. 6.	Los Angeles Rubber Group, Inc., Mayfair Hotel.
Nov. 8-9.	Association of American Battery Manufacturers, Inc. Annual Convention. Stevens Hotel, Chicago, Ill.
Nov. 9.	Chicago Rubber Group, Morrison Hotel, Chicago, Ill.
Nov. 16.	Akron Rubber Group. Mayflower Hotel, Akron, O.
Nov. 27.	Rubber & Plastics Division and Metropolitan Section, A.S.M.E. (Annual Meeting). Hotel Pennsylvania, New York, N. Y.
Dec. 4.	Los Angeles Rubber Group, Inc. Christmas Party.
Dec. 7.	Boston Rubber Group. Christmas Party. Copley Plaza Hotel, Boston, Mass.
Dec. 14.	Detroit Rubber & Plastics Group, Inc.
Dec. 14.	New York Rubber Group. Christmas Party. Building Trades Club, 2 Park Ave., New York, N. Y.

Annual Index Available

Owing to the paper shortage, our annual index is not incorporated in our October issue. Anyone, however, desiring copies of the index covering Volumes 111-112 (October 1944-September, 1945) of INDIA RUBBER WORLD, may secure them by phoning this office (MOhawk 4-1760) or writing to 386 Fourth Ave., New York 16, N. Y.

Detroit Group Meeting

A MEETING of the Detroit Rubber and Plastics Group was held on September 13 at the Detroit Leland Hotel, Detroit, Mich., with 110 members and guests present. The program consisted of a talk by Fred S. Conover, Naugatuck Chemical Division, United States Rubber Co., "GR-S Latices" and a showing of the sound movie, "Freedom Rides on Rubber," provided by the Firestone Tire & Rubber Co.

Mr. Conover discussed the comparative properties of natural and GR-S latices as to particle size, concentrations, composition, and properties. Physical properties of films obtained by varying the composition of the GR-S copolymer, together with the effect of curing times and temperatures on these films were explained, and the results illustrated by means of slides.

Kirkpatrick S.C.I. Medalist

THE Chemical Industry Medal (for 1945), awarded annually by the American Section of the Society of Chemical Industry, will be presented next month to Sidney D. Kirkpatrick, editor of *Chemical and Metallurgical Engineering,* in recognition of his leadership, executive competence, and contributions to the advancement of chemical engineering and research. Mr. Kirkpatrick, born in Urbana, Ill., in 1894, received his B.S. degree in chemical engineering from the University of Illinois in 1916. A director of the McGraw-Hill Book Co., New York, N. Y., with which he has been associated a quarter-century and consulting editor of its chemical engineering series of text and reference books, he has been active as consultant aiding in the establishment of the WPB Office of Production Research and Development. He also served in an advisory capacity for the Chemical Warfare Service and the Army Quartermaster Corps. In 1942, Mr. Kirkpatrick was elected president of the American Institute of Chemical Engineers and in 1944 he was elected to the same office in Electrochemical Society, Inc. Early in 1945 he served as a member of the Technical Industrial Intelligence Committee in England, France, and Germany, with the assimilated rank of brigadier-general.

Plastics Technology

Progress in Fabric Coating

James R. Geenty[1]

EARLY in 1942 the industry formerly known as the rubber proofing industry was denied the use of natural rubber for all but a few of its coated fabric applications, because of the necessity of conserving our rubber stockpile for the most essential military needs. Even these exceptions, which were mainly life-saving equipment and certain other types of products for which the Armed Services specified that only natural rubber must be used, had to be made without any natural rubber or with the amount used drastically reduced by the middle of 1943. As the extent of the required tremendous expansion of our military forces began to be realized, it became apparent that several million yards of coated fabrics would be needed for their use. With natural rubber available in only very limited amounts and with synthetic rubbers not yet available in quantity, the outlook for the proofing industry in the early days of the war was anything but bright. To the credit of this industry it may be said that in spite of a seemingly impossible situation, technicians, management, and labor attacked the problems with a determination to get on with the job using the materials available and at the same time maintaining as high standards of quality as possible.

In the early days of the war there remained reclaimed rubber, neoprene, "Thiokol," polyisobutylene, and Buna N types of rubbers available for coating work, with GR-S and GR-I (Butyl) available about a year later. Among the plastic materials useful to the industry were polyvinyl chloride and its copolymers, polyvinyl butyral and nitrocellulose.

Rubber Coatings

Reclaimed Rubber

Reclaimed rubbers alone did not make very satisfactory coatings. They were used to a considerable extent, but required too large amounts of reclaim by weight on the fabrics to produce the desired finished fabric properties. Since the introduction of GR-S, reclaimed rubber has been used with GR-S in much the same manner as it was used with natural rubber. In these blends the reclaim has the valuable characteristic of producing stocks that calender more smoothly and cements that flow more smoothly and have somewhat more tack than when the stocks contain reclaim alone.

Neoprene

Neoprene, one of the first commercial synthetic rubbers, has been used extensively in coated fabrics for products where oil resistance and resistance to the permeation of gases are major considerations. During the last ten or more years since neoprene was first put on the market, this polymer has been improved, and much more has been learned about the compounding and use of this synthetic rubber. For example, it has been found that the use of two or three softeners or plasticizers in a compound results in a greater softening of the rubber with less reduction of the final cured physical properties than when the total amount of plasticizer used consisted of one material only.

The plasticizers first used were mostly vegetable and mineral oils. Of the more recent types of plasticizers, the ester plasticizers have been used with very good results, and there are several types of factice and refined petroleum oils that are in constant use.

Neoprene stocks are generally compounded with soft carbon blacks, but the medium process channel type can also be used. The stocks adhere well to fabrics during the calendering operations, and the adhesion of neoprene cements to fabrics is also very good. Neoprene coated fabrics can be cured in dry heat and, when properly cured, age exceptionally well.

Polyisobutylene

Polyisobutylene has been employed in the production of combined fabrics where an uncured film was satisfactory. This rubber-like material has also been used in sizable amounts both alone and with other types of elastomers. Polyisobutylene makes a very smooth cement in ordinary naphtha, and it can be loaded quite heavily without losing its tack or very much tensile strength. Polyisobutylene has very good low-temperature flexibility, and a film of polyisobutylene on fabric has a very high resistance to the permeation of gases.

Buna N and "Thiokols"

Buna N and "Thiokols" are used to a limited extent in coated fabrics, mostly for special-purpose applications. A great deal of work was done with the Buna N type of rubbers in the prewar period, but this work had to be discontinued since these rubbers were required for more important war work. The Buna N type of rubbers might have more application in the coating field if their tendency to discolor fabrics were reduced, if some of the more common solvents could be used more satisfactorily for making cements, and if the rubbers themselves were lower in price. These butadiene-acrylonitrile rubbers do have an important use in blending with vinyl copolymer resins for products where the special properties that result are especially desired.

Up to the present time the "Thiokols" have been used primarily as special-purpose coatings where their high resistance to oils is of importance. Here again, the price of this material prevents more general use. In addition the fact that high-price solvents are necessary for the preparation of cements, mitigates also against greater use of the "Thiokols" for coating work.

GR-S

GR-S, the butadiene-styrene general-purpose rubber, which became available in quantity early in 1943 as a replacement for natural rubber, has been utilized in considerable amounts in coating operations. GR-S has many characteristics that are quite similar to natural rubber and a great many that are quite different. It is necessary to use a good deal more plasticizers with GR-S than with natural rubber, and breakdown is more difficult. The technique used with natural rubber of increasing the temperature of the calender rolls to smooth out the coating is not effective with GR-S. In calendering fabrics the more the GR-S stock is loaded the smoother the coating will be. For a time adhesion to fabrics was a serious problem and still presents many difficulties, but the production runs of GR-S that have been made during the past year have been much better and more uniform and have thus permitted the manufacture of higher quality coated fabrics. Some of the new tackifiers provided recently have further improved the adhesion of GR-S to fabrics.

In black stocks the choice of the proper-type black is very important if the best physical test results are to be obtained in the finished stock. In colors other than black, zinc oxide or other very fine particle-size fillers are best. The curing rate with GR-S is a little slower than with natural rubber but an increase in the temperature will usually remove this difficulty.

Satisfactory cements can be made with GR-S using standard rubber naphtha, and the cements handle quite well on rubber spreaders.

GR-S coated fabrics give reasonably good service when black stocks are used. In colors other than black, outdoor aging, flexing, and the results of accelerated weathering tests are not so good as when natural rubber or some of the other synthetic rubbers and resins are used.

GR-I (Butyl)

GR-I, or Butyl rubber, which has recently become available in limited volume, has had increasing acceptance particularly as a rubber for inner tubes during the past two years. This rubber has many properties that make it a very good coating material. GR-I can be made into cement with standard rubber naphtha and can be loaded very heavily for either calendered or spread fabric coatings. The adhesion to fabrics is good, and the coatings have unusual resistance to the passage of gases and good resistance to solvents. Compounding and curing techniques have been worked out so that they are quite similar to those used with natural rubber. Plasticizers used with GR-I have the advantage of being relatively inexpensive. In dry heat curing a little higher temperature than that used with natural rubber is required, but aging tests give results that are in general superior to those obtained with natural rubber and some of the other synthetic rubbers. The resistance to abrasion of GR-I is somewhat less than for natural rubber and other synthetic rubbers, but it is expected that future developments will provide a rubber with better resistance to scuffing and abrasive wear.

One of the largest postwar uses of GR-I will probably be in the manufacture of combined fabrics.

Plastic Coatings

Nitrocellulose

Nitrocellulose was one of the earliest plastics used by the coating industry. It was first employed as a coating material about the beginning of the Twentieth Century and has continued in use ever since. For fabric coating, nitrocellulose can be plasticized to almost any degree of flexibility, and with some of the new plasticizers that are now available, further improve-

[1] Chief chemist, Goodall-Sanford, Inc., Reading, Mass.



Goodall's Redolite Vinyl-Resin Coated Fabric Covering Walls

ments with this type of coating may be expected. Some of the ester and resin type of plasticizers have increased the flex and aging life of nitrocellulose coatings substantially. This plastic can be compounded to exhibit a wide variety of attractive colors; it is very resistant to abrasive wear and has the ability to withstand temperatures of 175 to 180° F. without becoming sticky or exuding plasticizer.

A great deal of nitrocellulose has been used for coatings during the last few years, and in some fields, notably the shoe field, it has replaced much of the rubber that was formerly used. Upholstery, book bindings, and simulated leather of all types will continue to be manufactured from this pioneer among synthetic resins. Nitrocellulose can be blended with some of the newer resins to form mixtures that have very interesting properties, such as improved flexibility, particularly at low temperatures, better flammability resistance, and long aging. In brief, this plastic has been proved as to its properties and applications over a considerable period of time and may well continue to be used in considerable volume in the coating industry.

Vinyl Chloride and Copolymers

Polyvinyl chloride has been known for over a hundred years, but it was not until 1927 that this resin was investigated for industrial use. By about 1935 copolymers of vinyl chloride and vinyl acetate were being made commercially. Most of the early resins were of low molecular weight and high in acetate content. In 1937 the first high molecular weight, high vinyl chloride copolymers became available, and later the vinyl chloride-vinylidene chloride copolymers were introduced. For the purposes of this discussion the term vinyl copolymer will include all types of vinyl chloride-acetate, vinyl chloride-vinylidene chloride copolymers.

Vinyl copolymer resins as a class are very resistant to water, acids, oils, greases, and alcohol and quite resistant to medium concentrations of alkalies. The high molecular weight-type resins have the best physical properties, including maximum resistance to flex cracking, abrasion loss, solvents, freedom from blocking at temperatures of 180 to 200° F., and good low temperature flexibility.

These resins can be spread on fabrics from solutions, generally from hot solutions, and quite often a mixture of one or more resins are used to aid solubility in hot solvents. The most commonly used solvents are methyl ethyl ketone and methyl isobutyl ketone. Cyclohexanone, mesityl oxide, or isophorone can be used either alone or as mixtures, and in some cases one or more of these three may be advantageously added to the ketones. Coating with hot solutions has some disadvantages, and there has lately been a trend toward the use of resins dispersed in non-solvents such as tolulene and petroleum naptha. This type of dispersion is commonly known as an organosol. The fabric is coated with the dispersed resin compound, and then after the liquid is driven off, exposed to a relatively high temperature for a short time, to form the resin into a continuous film, which then has all the desirable properties of films applied from solutions or by means of a calendering operation. Considerable development work is at present being done to improve the process of coating with dispersed resins, and indications are that this method may eventually replace solution coating and even some of the calender coating operations where lightweight films are produced. Considerable work has also been done with resins dispersed in water, that is as latices, and, in general, the same procedures during the coating operation, as have been described for the organosols, are followed.

Higher temperatures in the Banbury, on the mixing mills, and on the calender are required with vinyl copolymers. No breakdown period is necessary, and power consumption during the mixing and calendering of these resins is much less than with rubber. Fillers can be incorporated in rather limited amounts since too-heavy loading reduces considerably the final physical properties.

Fabrics coated with vinyl copolymer resins have a hard, dry surface while still being quite pliable and resilient. Adhesion to fabrics, in general, is good, and beautiful designs can be embossed on the coated surface. As the resins are colorless, almost any color desired can be produced provided a suitable, non-bleeding pigment is used.

During the war a large amount of vinyl copolymer resin coatings was used by the Armed Services, and it was found that very light coatings of properly compounded resins of this type gave very good service. Coatings for military use had the advantage of the very best plasticizers, but coatings now being made for civilian use have not always contained the best plasticizers, and as a result some of the poor performance of the civilian coatings has been unjustly attributed to the resin. This poor performance included sweating out of the plasticizer, rapid stiffening of the fabrics, low-temperature cracking, and undesirable odor. It is regrettable that so much of this poorly plasticized coating has been manufactured, as it has resulted in unfavorable and unjust comment regarding the future of this type of resin for fabric coating work. More of the better-quality plasticizers are now becoming available for civilian use, and it is hoped the industry will take full advantage of this situation to produce only coatings of superior performance characteristics.

Vinyl copolymer resins are here to stay as a coating material, and their usage will probably increase in this field. It is understood that there are several new plasticizers not yet on the market whose use will permit the manufacture of coatings that will be even better than any that have been made previously. Considerable activity is also reported in research on the copolymer resins themselves; so new and better resins are expected to appear in the very near future.

Polyvinyl Butyrals

Polyvinyl butyral thermoplastic resins, which had been used in the prewar period as one of the main constituents of safety glass, became available to the coating industry early in the war, when one of the leading technologists of the industry discovered a method of producing flexible thermosetting coating from this thermoplastic resin. Polyvinyl butyral has since had considerable use as both a thermoplastic and a thermosetting coating.

These resins can be made to resemble closely natural rubber when coated on fabric, and they have the important advantage of handling in a similar manner in the factory. Polyvinyl butyrals do not require any breakdown and can be mixed on open mills or in a Banbury. Calender temperatures are the same as with natural rubber. When these resins are made into a cement, the procedure is the same as with natural rubber, and part of the solvent used may be standard rubber naphtha. After coating, the butyral resins can be thermoset in much the same manner as natural rubber is vulcanized, that is, by festooning or hanging in ovens and then cured by the regular dry heat method. One of the chief advantages of these resins is that fabricated articles can be made up, laps and joints cemented, and the entire article cured, thus producing a thermoset coating which is continuous and has very high adhesion at the seams or joints.

Another advantage of these resins is their ability to hold plasticizers over long periods without "sweating out." They may be compounded in a manner similar to rubber as far as pigmenting and loading are concerned, and they may be used with fairly high loadings without a very great loss of physical properties of the finished product. Transparent coatings of the butyrals appear to age quite well and, if suitably prepared, do not discolor badly on outdoor exposure. Lightweight coatings, two to three ounces per square yard, are waterproof and are considered by many technologists to be equal to a six-ounce per square yard coating of natural rubber.

At present it appears that butyral coatings will be higher in price than some of the other rubber and resin coatings, but undoubtedly butyral coatings will continue to be used where they have proved to be superior to any of the other materials that have been used for fabrics coating.

Other Plastics

There are several other resins which have been used to some extent, such as ethyl cellulose, cellulose acetobutyrate, and styrene. Styrene is going to be available in better volume, and as soon as satisfactory plasticizers can be found, it will be a very interesting resin which should have several applications in the coating field.

Conclusions

The industry formerly known as the rubber proofing industry has branched out considerably during the past 3½ years and has probably used more plastic resins than any other type of material for coating fabrics. What the future relation between natural rubber, synthetic rubbers, and plastic resins will be is at this time hard to predict, but certainly Butyl rubber and most of the above-mentioned plastic resins have established themselves as desirable materials for use by the coating industry. GR-S may replace natural rubber in some cases; in fact, in some latex coatings GR-S is preferred to natural rubber latex. The oil-resistant type of synthetic rubbers will continue to be special-purpose materials in the coating industry.

There are several new rubbers and plastic resins that are soon to be made available, and if the new plasticizers which have also been promised materialize, the coating industry may expand further into fields previously closed to it when natural rubber was the only material generally available. With these new materials coming on the market, in addition to the plastic resins now in use, the coated fabrics industry should, in self-protection, establish standards of finished product quality and try to maintain them for the good of the entire industry.

The author wishes to express his thanks to W. F. Murphy, of Goodall-Sanford, Inc., for technical assistance and review of this article.

Plexiglas Plastic for Homes

RECONVERSION to peacetime is shown in a three-room apartment almost exclusively built with Plexiglas. Plexiglas the wartime plastic from which bomber noses, turrets, and blisters were made, seems to have an excellent postwar prospect as appears evident from this exhibit.

Designed by Rohm & Haas Co., Philadelphia, Pa., who originated and developed the clear-as-glass methyl-methacrylate plastic, the apartment is intended to convey to architects, designers, and home builders the unique and manifold possibilities which the new compound offers in the design of the modern home. Certain specific characteristics of Plexiglas offer some revolutionary opportunities when incorporated in the new home.

The demonstration apartment, consisting of a transparent-walled bedroom, a dressing room, and a bathroom with a turret-shaped transparent shower, is far more accessible to light as the building materials are transparent. Indirect, smooth, and shadowless lighting is accomplished through the unique light-piping characteristics of Plexiglas. Chip-proof sinks and a shower floor of body or room temperature are other features based on the characteristics of the new material. "Radiant walls" furnish decoration as well as illumination for the dressing room. The easy moldability and the light piping qualities of Plexiglas open new vistas for the designer. Practically every item in the sample apartment is made of Plexiglas, and care is taken to emphasize the outstanding new possibilities of the methyl-methacrylate plastic in this peacetime application.



The Bathroom Unit of the "Plexiglas Dream Suite." The Shatterproof Shower Stall Is on the Left, and Set into an Unbroken Continuation of the Dressing Table on the Right Is a Plexiglas Basin, above Which Is a Unique Non-Fogging Plexiglas Mirror

Since Plexiglas is thermoplastic, it can readily be formed. It can also be machined, using wood-working tools. It is less than half as heavy as glass; it has a light transmission value of 92% (equal to that of fine optical glass) and is practically unbreakable. Exposure to sunlight and weathering for a period of two years lowers its light transmission only by 1%.

The demonstration apartment started a national tour of department stores and architectural centers, opening at John Wanamaker & Co. in Philadelphia on September 12.

R. M. A. Reports on New Developments in Coated Fabrics

A MODEST revolution in outdoor sportswear, upholstery, protective clothing and safety garments, drapes, curtains, and wall covering materials has been forecast by The Rubber Manufacturers Association, Inc., 444 Madison Ave., New York, N. Y. Both new and standard rubber and synthetic rubber compounds, oil, pyroxylin, and synthetic resins of the polyvinyl chloride and butyral types have with the sudden end of the war become available for civilian production and consumption. New synthetic rubber and resin compounds are expected to supplant other coating materials because of their high resistance to oil and grease. These materials together with rubber coated fabrics which are resistant to many acids and other corrosives will greatly diversify the fields of safety garments and protective clothing.

Polyvinyl butyral, which is flame-, stain-, and water-proof when applied as a coating to materials, holds great promise in a new line of hunting and fishing wear and for shower curtains, draperies, and upholstery. Polyvinyl chlorides with similar properties as the polyvinyl butyral have been released again for civilian use. All materials except natural rubber and GR-I (Butyl) are again available, and natural rubber is expected to be available in 1946.

Thus with all the coating materials again on hand and considering the tremendous advances which have been made during the war in the coating industry, The Rubber Manufacturers Association believes that great improvements in coated fabrics will soon be ready for the public.

Postwar Increase in Plastics

WHILE the use of plastics during the war years increased from $78,000,000 to $332,000,000 or 325%, a further increase of 25 to 30% is predicted by Wm. S. Landes, president of the Plastics Materials Manufacturers Association. The nation's plastics materials production has advanced 20 years in research, during the last five years of intensive development which had been spurred by the war. With reconversion to peacetime operations many of the spectacular advances discovered through wartime research will be available to the general public now, and an increase in demand will be a natural result. With all the new opportunities for application of plastics, new machinery will have to be installed on a large scale, and this retooling as well as the increased demand will mean a considerable increase in employment in the plastics industry during the ensuing period of production and market development. Mr. Landes believes that the plastics industry, which, if measured by quantity production, is still a small industry, will expand greatly within the foreseeable future, providing opportunities for employment and the establishment of new businesses.

In the prewar automobile about two to five pounds of plastics were used. Automotive engineers would like to use 10 to 20 pounds of plastics per car, but much more experimentation by the plastics and by the automobile industries must be completed before this is possible. Use in fenders and rear decks is practicable from a structural strength standpoint, but the

(*Continued on page* 142)

RUBBER WORLD
NEWS of the MONTH

Highlights—

During September, reports on the WPB Rubber Industry Advisory Committee meeting of August 28 and that of the Surplus Property Board's Tire and Tube Manufacturers Industry Advisory Committee on August 31, together with reports from The Rubber Manufacturers Association, Inc., and individual manufacturers themselves, provided a little better picture of developments and plans of the industry for reconversion to peacetime production. An important step toward keeping the discussion and solution of problems of the rubber industry on a high government level was taken with the formation of an interagency committee on rubber by OWMR Director John W. Snyder. The necessity of such a committee was suggested by WPB Chairman J. A. Krug and Director of Rubber Programs Robert S. Wilson. Many labor disturbances plagued reconversion efforts of the industry, and the URWA on September 14 announced a campaign for changes in wage contracts to provide equivalent "take-home" pay for peacetime hours since its members were now receiving lower wages because of the loss of overtime war work. The foremen's strike at the Akron plants of The B. F. Goodrich Co., begun September 3, finally ended September 25.

Industry Reconversion Developments

During September, developments and plans for reconversion became better known. Since the increased production of civilian rubber goods can not hope to make much of an impression on 3½ years of pent-up demand for several months, it was generally considered that during the next two years the rubber industry should operate at a high production rate if, as one manufacturer put it, "we can secure some measure of labor peace."

The Rubber Industry Advisory Committee of the WPB met in Washington on August 28 to consider the following topics: (1) the tentative Basis VIII tire and tube production schedule; (2) the component situation; (3) the outlook for rubber; (4) reconversion to increased use of natural rubber; (5) final cut-backs in the plant expansion program; (6) operation of the ODP, RFC, facilities; (7) rationing; (8) WPB priority policies; and (9) prospective changes in the Rubber Bureau. A report of this meeting, which was received on September 11 and a good portion of which was incorporated into an editorial survey article which appears in this issue (page 69), provided much important information on plans and future possible trends of the industry. The above-mentioned survey article also contains statements from a number of heads of rubber goods manufacturing companies on this subject of reconversion problems, which should be of considerable additional interest.

Two industrial leaders in radio talks over the Mutual Broadcasting System on "Reconversion and Jobs" added further information to confirm the optimistic outlook for a postwar boom in the major manufacturing industries including rubber. John L. Collyer, president of The B. F. Goodrich Co., in his talk on September 5 stated that "the rubber industry will have employment levels lower than for peak war production, but substantially greater than before the war, and is mighty keen to have its veterans return to their old jobs." He added that the present job of putting good tires on the wheels of America's 30 million civilian vehicles, while keeping pace with the automotive industry as it gets into peacetime swing, means that a number of plants in the rubber industry have the "help wanted" sign out. His own company, Mr. Collyer said, expects to have work for about 30% more men and women in 1946 than in 1940.

In his address on "Reconversion and Jobs" on September 12, Lammot du Pont, chairman of the board, E. I. du Pont de Nemours & Co., Inc., declared that in his opinion our industrial system could provide a high level of employment since all the factors necessary to create unequalled prosperity in America are at hand.

"Never before in history have we had such a combination of skilled labor, productive capacity, managerial ability, scientific research facilities, and such a backlog of demand for goods and services. Never have we had such an accumulation of buying power or so wide a distribution in the hands of the public," Mr. du Pont added. "In the chemical industry, of which I represent but one of many, many parts, the outlook today is extremely encouraging. In the du Pont company, we are optimistic both as to our own prospects and to the prospects of business generally. We have every reason to expect that postwar employment in our own company will exceed that of any peacetime year. We believe that our sales volume in two years or so from now will exceed our 1939 totals by as much as 50%. Within five years, we have forecast that our sales in new prewar and postwar products together should equal our entire 1939 output of older products," he also said.

RMA Reports on Tires and Footwear

The Rubber Manufacturers Association, Inc., resumed its monthly reports on production in the United States of automotive pneumatic casings and inner tubes, releasing manufacturing data which has been subject to a security blackout since March, 1942. In resuming its reports the Association departs from its prewar formula to include a breakdown of figures showing production in civilian passenger car, truck, and bus casings and in tubes, A. L. Viles, its president, pointed out.

"Production figures in these categories were not shown prior to the war. In light of widespread public interest in tire supplies during the war, and the fact that this interest appears to be continuing into the reconversion period, the association hereafter will detail production in all categories in each of its monthly reports," Mr. Viles explained.

Two reports have been issued at this writing, one for June and one for July, 1945. Since the second report contains almost all of the information for June, 1945, as well as July, 1945, only the second report will be given here. Outstanding fact disclosed in the tabulation of tire and tube data was the sharp change in the relation of inventory to production for the first seven months ending in July, 1945, as compared with the first seven peacetime months of 1941. Production of passenger-car casings for the first seven months of 1941 totaled 33,729,258 units, with 4,760,991 units held in inventory. Estimated production for the seven months ended July 31 was 11,959,467 units, with only 1,016,615 units in inventory.

At the same time the report reflects the vast increase in truck and bus tire production, stepped up by the industry to meet unprecedented military demand. Truck and bus tire production stood at 6,491,240 units for the seven months ending July 31, 1941. Production in the first seven months this year, with an output estimated at 11,255,569 units, shows a gain of about 75%. The truck and bus inventory stood at 782,877 units for the first seven months of 1945, as compared with 1,473,758 units for the same period in 1941.

Principal reason for the unusually low inventory position is found in the fact that OPA was compelled to release tires more rapidly than they were being built during the war. The fact that the supply continued tight throughout the war, however, is evident in the government's action even this summer in dipping into its small stockpile of tires to keep essential war workers on the road. Ration allowances for June and July were in excess of tire production.

"At the same time, it must be borne in mind that the figures shown in this report reflect the situation as it existed two weeks before V-J Day," Mr. Viles pointed out.

"With the war behind us and the industry quickly converting to peacetime production, there is every indication that civilian passenger car tire supplies will increase rapidly."

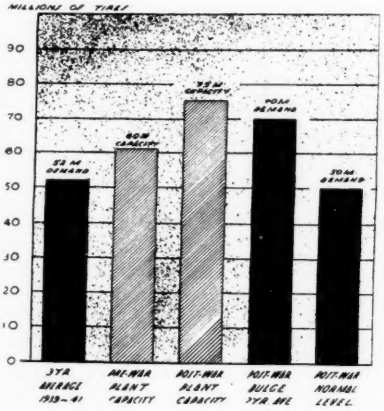
The report covers only automotive pneumatic casings. It does not include any solid rubber tires or pneumatic tires for motorcycles, bicycles, or for aviation, agricultural, or industrial equipment.

The accompanying charts issued by the statistician's office of the Goodyear Tire & Rubber Co. on prewar and postwar capacity and demand for passenger-car and truck and bus tires are also of special interest in connection with this subject of tire production. Abrupt ending of the Japanese war, cut-backs in proposed expansion of existing facilities, and cancellations of new plants are reflected in these revised charts. Four months ago comparative charts issued by Goodyear showed the industry aiming at a postwar capacity of 89 million passenger-car tires. Estimated demand then was the same as now. Passenger-tire capacity at present is placed at 75 million tires, with a consumer demand for the two-year postwar "bulge" estimated at 70 million tires yearly.

In the truck and bus field the revised charts show the industry's capacity at 16 million tires, as against a previously estimated 18 million figure. Demand for the next two years averages 13 million tires

ESTIMATED AUTOMOTIVE PNEUMATIC CASING & TUBE SHIPMENTS PRODUCTION & INVENTORY—JULY, 1945,—FIRST SEVEN MONTHS, 1945 AND 1941

	Original Equipment	Replacement: War Orders	Replacement: Civilian	Export	Total Shipments	Production During Month	Inventory End of Month
Passenger Casings							
July, 1945	34,162	5,721	1,819,909	8,363	1,868,155	1,938,650	.....
June, 1945	27,036	10,638	1,767,481	18,451	1,823,606	1,968,498	950,412
First 7 mos., 1945	178,593	111,918	11,501,614	102,601	11,894,726	11,959,467	1,016,615
First 7 mos., 1941	14,345,072	.....	21,516,933	438,350	36,300,355	33,729,258	4,760,991
Truck & Bus Casings							
July, 1945	372,935	227,013	458,113	14,782	1,072,843	1,115,510	.....
June, 1945	425,239	598,119	452,089	27,739	1,503,186	1,465,912	738,236
First 7 mos., 1945	3,612,087	4,337,667	3,113,240	110,177	11,173,171	11,255,569	782,877
First 7 mos., 1941	2,755,244	.....	3,378,746	555,687	6,689,677	6,491,240	1,473,758
Total Casings							
July, 1945	407,097	232,734	2,278,022	23,145	2,940,998	3,054,160	.....
June, 1945	452,275	608,757	2,219,570	46,190	3,326,792	3,434,410	1,688,648
First 7 mos., 1945	3,790,680	4,449,585	14,614,854	212,778	23,067,897	23,215,036	1,799,492
First 7 mos., 1941	17,100,316	.....	24,895,679	994,037	42,990,032	40,220,498	6,234,749
Passenger, Truck, and Bus Tubes							
July, 1945	440,043	452,616	2,046,883	19,048	2,958,590	3,049,595	.....
June, 1945	462,002	584,972	1,926,012	35,079	3,008,065	3,104,123	2,601,379
First 7 mos., 1945	3,864,428	4,215,371	13,763,419	155,305	21,998,523	22,322,186	2,597,167
First 7 mos., 1941	17,090,553	.....	20,837,005	831,469	38,759,027	38,211,637	6,356,726



Passenger Tires—Prewar and Postwar Capacity vs. Demand

a year. It is then expected to settle down to a postwar normal level of at least nine million tires a year.

Returning again to the RMA reports, it was stated on September 24 that production of rubber heels and soles contiunes substantially short of capacity because of labor shortages. With the industry facing the greatest civilian demand on record, it is still in need of workers. To date the government's action in lifting labor controls on V-J Day has not completely solved manpower problems.

Consensus of major manufacturers is that capacity operation will be necessary for many months to wipe out a four-year backlog of civilian orders, to meet current demand in this country, and to keep pace with export requirements. Indications of a continuing world shortage in leather for a considerable period further emphasize this need of manpower.

Reviewing the industry's wartime job, the Association listed more than 1,400 special types of heels and soles supplied to the Armed Forces, observing that in 1944 alone production had run to 206 million pairs of rubber soles and 383 million pairs of rubber heels for combined military and civilian use.

In helping make U. S. troops the best shod in action, the industry put the Armed Forces entirely on rubber heels and soles for the first time in military history. Special types for use on everything from rock and sand to ice and coral and for extra wear in every band of climate from the equator to the North Pole were developed. An outstanding example of special-purpose design was a non-skid rubber sole developed to keep rushing deck crewmen from skidding on oil-slick carrier decks and sliding into propellers as Navy fighter planes came in for quick refueling and rearming during battle action. In an extremely short time the footwear industry developed a special-type rubber sole with a soft, clinging, molded rubber insert which cut down accidents on carrier decks to an amazing degree.

In addition to service under special conditions, heels and soles made of rubber were recently demonstrated in performance tests at Camp Lee, Va., to give twice the wear of top-grade leather.

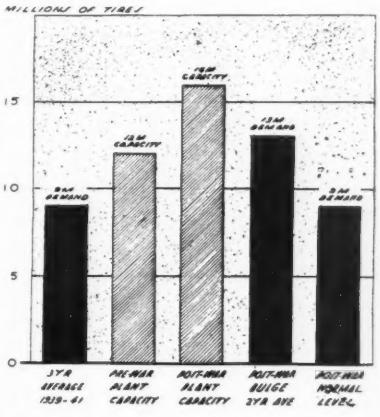
To meet both military requirements and now greatly increased civilian requirements, the industry has stepped up capacity sharply. Manufacturers turned out 128 million pairs of rubber soles in 1941. New facilities put rated capacity at approximately 300 million pairs of rubber soles and approximately 500 million pairs of rubber heels, the Association said.

Postwar, manufacturers feel there will be rather extensive use of synthetic rubber. The industry has made rapid progress in solving the problems presented after Pearl Harbor. Many manufacturers believe that a large percentage of rubber heels will be made of synthetic rubber exclusively, and that this raw material may be combined with either natural rubber or plastics in the manufacture of many types of soles.

Meantime, the Association reported, the heel and sole industry has developed brand new materials which it regards as an improvement on and potentially a direct substitute for leather. Many feel that these materials are now opening a new field hitherto untouched by rubber heel and sole manufacturers.

In another report on September 27 the RMA stated that while tire manufacturers are converting to peacetime production as rapidly as possible, production gains remain inadequate to date to wipe out an accumulated four-year backlog of civilian passenger tire demands.

Output since V-J Day has been limited by two factors: (1) the time lag involved in retooling for civilian production; and (2) production losses rising out of labor disputes. In light of these factors, it appears extremely unlikely that the government can increase monthly passenger tire allocations on October 1, it was said. Rising production could lead to supplemental allocations of tires for passenger-car drivers at a later date, but as of today an end to the rationing of passenger-car tires is not in sight.



Truck-Bus Tires—Prewar and Postwar Capacity vs. Demand

At the same time Association spokesmen pointed out that the reconversion program still is aimed at production of 12 million passenger-car tires in the final quarter of 1945 and at 66 million tires in 1946. Realization of these goals could spell an end of rationing late this year or early next, but in the meantime OPA is confronted with the problem of meeting tire demands so far in excess of current production that they have actually doubled since V-J Day.

Until this pent-up demand of first- and second-preference drivers can be met, operators will be compelled to recap and to observe rubber-conserving safety speeds if all civilian passenger cars are to be kept on the road through the winter, the Association emphasized.

OPA Reports on Tires

The OPA and the WPB issued a joint statement on September 17 in which they pointed out that the demand for passenger-car tires has increased so rapidly since the lifting of gasoline rationing and is so far ahead of current production that it will be many months before motorists get all the new tires they need.

"Unfilled applications for passenger car tires, which totaled 517,715 at the end of July, have been piling up so rapidly that they may reach 1,000,000 by September 30," Chester Bowles, OPA Administrator, said.

His agency explained that maximum quotas, set somewhat in excess of production in order to make use of limited inventories that were available, were granted during the summer months. Certificates issued against these quotas have cut deeply

into dealers' inventories, and until production catches up with certificates issued in the past and currently, this tight situation will continue.

To help meet heavy demands for bus and truck tires without increasing backlogs of unfilled applications, susbtantial additions to the September bus and truck tire quotas were allocated by the WPB to the OPA.

The supplemental WPB allocations for rationing to consumers consisted of 140,000 small-size truck tires, 7.50 and under, and 50,000 truck tires size 8.25 or larger. Of the small-size truck tires, 40,000 were 10-ply in sizes 7.00 by 20 and 7.50 by 20, and the remaining were in all other sizes and plies in the smaller group. Original September quotas provided for 386,862 small truck tires and 200,000 truck tires size 8.25 and larger.

New Inter-Agency Committee on Rubber

The report on the Rubber Industry Advisory Committee meeting of August 28 mentioned that the WPB had suggested to the Office of War Mobilization and Reconversion that it create an overall policy committee with authority to act on rubber problems. OWMR Director John W. Snyder on September 8 appointed William L. Batt, WPB vice chairman for international supply, to head this new committee as a representative of the OWMR. It is understood that two of the foremost problems to be tackled by Mr. Batt's committee are the disposal of government synthetic rubber plants and the price to be paid for natural rubber that must be bought in some quantity from the Dutch, British, and others. In this connection it was reported from London on September 18 that the first steps toward rehabilitation of the Malayan rubber industry had been taken with the pegging of the price at 36¢ a pound (Straits currency; U. S. equivalent 17¢) and establishment of a rubber control unit to set up buying centers in all producing districts. In New York representatives of the rubber industry questioned this report and emphasized that it was unlikely any price would be set in absence of any international agreement.

Besides Mr. Snyder's office the following agencies will be represented on the committee: State, Justice, War, and Navy departments, Surplus Property Board, Reconstruction Finance Corp., and Foreign Economic Administration. Top rubber company executives, including Mr. Collyer, of Goodrich, P. W. Litchfield, of Goodyear, H. S. Firestone, Jr., of Firestone Tire & Rubber Co., and F. B. Davis, Jr., of United States Rubber, are expected to assist the committee in formulating U. S. domestic and foreign rubber policy.

Thomas Recommends Permanent Stockpile

John W. Thomas, chairman of the Firestone company, in a brochure titled "America Should Have a Rubber Stockpile," made public on August 31, recommended creation of a large government-owned stockpile of natural rubber and continuance of a broad research program in the field of synthetic rubber. Acquisition of the stockpile could be started as soon as accumulated needs of synthetic and natural rubber products have been met, he said. It was pointed out that even in the last days of World War II, despite the swift progress of the synthetic rubber industry, the minimum requirement of natural rubber was 14% of the total rubber compound.

Discussing the size of the proposed stockpile, Mr. Thomas said that the reserve should be adequate to meet emergency military and civilian needs for 15 months—the time that would be required to build additional synthetic rubber plants, if needed—and also should be sufficient to supply minimum essential needs of natural rubber for natural and synthetic rubber compounds for five years.

"As a further factor of safety, each manufacturer should be pledged to maintain in this country a working minimum inventory of natural rubber," Mr. Thomas continued. "This minimum should perhaps be a 60-day average of requirements for rubber of this type.

"Since the stockpile would be a national resource to serve the country as a whole, it follows that it should be owned and operated by the United States Government."

Mr. Thomas suggested that the stockpile rubber be stored in igloo-type magazines now used for storage at 30 munitions depots scattered throughout the country. These units, he said, would provide ideal storage for ribbed smoked sheet plantation rubber because temperature, humidity, and ventilation in them are highly suitable for the purpose, and their maintenance cost is low. Each igloo, which could accommodate 200 tons of rubber, is sufficiently isolated from others to provide a high degree of safety from fire.

SPB Tire and Tube Meeting

The Surplus Property Board held a meeting with its Tire and Tube Manufacturers Industry Advisory Committee, on August 31, in Washington to receive recommendations from which to formulate policy for disposal of surplus tires and tubes. J. V. McCullough, director, automotive division, consumer goods, SPB, acted as chairman, and 17 representatives of various government agencies including the Army and Navy, WPB, ODT, OPA, OSP-Commerce, Interior, Agriculture, and SPB were in attendance.

The SPB's Tire and Tube Industry Advisory Committee consists of Walter D. Baldwin, U. S. Rubber, New York, N. Y.; W. C. Behoteguy, Goodrich, Akron, O.; J. L. Cochrun, Seiberling Rubber Co., Akron; I. Eisbrouch, The Dayton Rubber Mfg. Co., Dayton, O.; Victor D. Kniss, Firestone, Akron; Clarence C. Osmun, Goodyear, Akron; J. F. Schaefer, Cooper Corp., Findlay, O.; and H. F. Webster, Denman Tire & Rubber Co., Warren, O.

Carl H. Monsees (SPB) described the organization and functions of SPB and the Disposal Agencies under the Surplus Property Act of 1944.

The SPB has been notified by the Attorney General that the use of industry advisory committees for consultation within the limitations outlined in SPB's letter of August 2, 1945, does not violate the anti-trust laws.

Mr. McCullough pointed out that the act establishing the SPB provides for the disposal of surplus property through normal trade channels wherever possible and consistent with other overall objectives.

Many complicating factors must be studied carefully in connection with the establishment of a sales procedure for the large quantities to be declared surplus, and due consideration will be given to suggestions offered by the tire manufacturers and by independent tire dealers. Some of the major problems arise from uncertainty with regard to tire rationing; lack of definite information regarding quantities, types, sizes, and locations of surplus stocks; and uncertainty regarding the dates on which the tires will be available for disposal. Besides is the problem of assuring equitable distribution of stocks among the tire dealers of the country, it was emphasized by James A. Troy (Department of Commerce). In establishing the procedures, the Department of Commerce will do everything possible to assure an orderly flow of the commodities in a manner that will cause the least possible disruption to the industry.

With respect to quantities to be declared surplus, there appeared to be some discrepancies in various tabulations and estimates. At the recent meeting of the WPB Industry Advisory Committee, the tire industry was informed that an estimated 535,000 tires of specified types would be declared surplus. Major Colton (War Department) was not prepared to comment on the overall situation, but explained that the August 17, 1945, declaration covered 254,987 new tires and tubes, of which approximately 60,000 were tubes. Lieutenant Ambrose (Navy) did not care to estimate surplus declarations by the Navy.

In reply to Mr. McCullough's request for recommendations on disposal policies for surplus tires and tubes, one member of the committee presented a stateemnt which, at the suggestion of other members of the committee, is quoted in full as representing the committee's suggestions and recommendations:

"The tire industry, through the War Production Board, has been advised that the Army has for disposal, through the Surplus Property Board, an estimated 535,000 tires. Of this total, 200,000 are 6.00-16 6-ply mud and snow tires, and 150,000 are 7.50-20 8-ply mud and snow tires. The first size was produced for use on jeeps, and the second, a special tire, for use on 2½ ton trucks.

"In making these tires available for civilians, they will be used for purposes not originally contemplated, and for this reason it is expected that various mechanical difficulties will arise and that there will be product difficulties greater than normal.

"It is the industry's understanding that the Army is desirous of disposing of these tires rapidly and getting them into civilian use while the present shortage and need exist.

"In view of these conditions, I believe the proper manner in which this can best be accomplished would be through the regular distribution channels of the tire industry. As has previously been done with respect to surplus of new and used Army tires, offerings would be made to tire manufacturers on an allocation arrangement based upon statistical data now in the hands of the Surplus Property Board. This would provide quick, widespread, and equitable distribution and permit the Surplus Property Board to deal with firms of unquestioned financial standing. In addition, the Treasury Department under this method would be protected with respect to excise taxes. This also would assure observance of applicable OPA tire rationing regulations.

"It is understood that these tires are located at 15 Army depots, from which shipment could be made either to the manufacturer's warehouses or direct to dealers, dependent on conditions and whether or not these warehouses are so set up as to be able to handle a great many small drop shipments. I am confident the industry would consider making available administrative personnel to assist in expediting distribution of surplus tires at these warehouse points.

"However, before the industry would

consider undertaking the distribution of this merchandise and before arrangements are completed as to quantities, prices, and methods of shipment, I believe the Army and the Surplus Property Board should carefully consider the following points:

"1. The industry is now going through the problem of reconversion from war to civilian production. To cope with this, it has proceeded with full knowledge of the immediate need for civilian tires, so production schedules and manpower have been set up on the basis of capacity production at the earliest possible date and with no regard for the possible effect on these plans caused by the dumping on the market of surplus government stocks.

"The industry, of course, realizes that such a thing must happen, but has no knowledge of the timing or the quantities involved. It is hopeful that the flow of this military merchandise into the civilian market may be regulated in such a manner that too great an upset will not occur in the production plans of the industry, with consequent serious effect on the manpower situation. I believe this best can be accomplished through immediate action.

"2. Although the industry has no knowledge of any government plans which might anticipate the shipment of tires abroad, either for use in occupied countries or in liberated areas, I am hopeful that this entire possibility may be thoroughly canvassed.

"It would seem desirable that, if such a need is going to arise, the tires in question be used for this purpose rather than to take out of current production tires better adapted for the local need.

"With the elimination of lend-lease, it would still seem possible that many countries will be ready and anxious to purchase tires of this type on a cash basis.

"3. In view of the circumstances outlined in (1) and (2), the industry, I am sure, is hopeful that the Army, Navy, and other governmental agencies, in scheduling for return surplus stocks, will make certain that their own needs for at least a year's period are scheduled to be filled out of present stocks—this both from the standpoint of the economical use of the tires through application to vehicles for which they were intended, and the possibility, through retention of as large a stock as possible, of a minimum upset of the labor situation.

"4. Truck manufacturers have stocks of tires intended for original equipment of Army vehicles. The Army should immediately include these in its stock of surplus tires rather than require the truck manufacturers to prevail upon tire manufacturers to accept return of these tires.

"To permit immediate distribution and consumer wheel-use of these surplus tires, I strongly recommend that the Rationing Division of the Office of Price Administration take immediate steps to handle all non-directional mud and snow tires outside of rationing.

"In urging that this be done, it should be kept in mind first that the user and the dealer are going to be reluctant to exchange rationing certificates for these tires. With tires in regular sizes and conventional treads coming rapidly into production, both the dealer and the consumer are going to prefer the tire of a later and proper construction.

"There is an element of chance in the length of time it is going to be necessary for the dealer to hold these tires before he can sell them, and generally it is necessary for the dealer to turn his certificates as rapidly as possible. Probably if time were not the essence, distribution could be effected through rationing, but if the quick job that is necessary is to be done, all rationing restraints should be withdrawn."

Representatives of the various Government agencies present considered the statement fair and reasonable. Mr. McCullough emphasized that due consideration would be given to the specific recommendations and to the general thinking of the industry as brought out in the discussion.

Other items discussed at the SPB meeting included used and new tires and tubes. Up to now there has been a ready sale for used tires, but within a very short time, the industry advisory committee members said, it will be unable to move these used tires at any price, and it was the consensus of opinion that Class C-1 tires should be sold as scrap, and the C-1 classification removed from present classification standards.

One member suggested that all surplus stocks be classified into various sizes, and that within each size the tires be classified as follows: (1) not usable for civilian uses; (2) usable in lieu of no civilian tires (limited use); and (3) conventional type or regular highway tread tires which are usable for civilian vehicles.

It was also the consensus that the pricing policies should be kept as simple as possible and that they should be flexible to permit adjustments for varying degrees of obsolescence, off-standard materials, etc. A sliding scale of discounts for the three categories of tires should be set up with sufficient flexibility within each category to take care of variations. Moreover the discounts should be set up on the basis of delivery dates.

Members stated that the discounts previously in effect are no longer satisfactory to the industry. One member expressed the personal opinion that tires in the usable category should be subject to a discount of 75% of cost. Even at this figure, he said, industry will have considerable difficulty in marketing the tires. Another member favored a slightly lower discount; he believed the industry should be prepared to take some financial losses in the liquidation of stocks rather than subject itself to undue criticism.

In reply to questions regarding the prorating of the tires among the individual companies, Mr. Troy stated that distribution based on 1942 sales had worked fairly well in the past. Recently, however, difficulties have arisen from the fact that small companies are unwilling to accept the larger tires, for which they say there is no market. One member suggested that the various companies report to RMA whether they are interested so that RMA can make the necessary reallocations to industry.

Industrial Relations

In a month filled with labor disturbances all over the country, the rubber industry did not escape its share of this type of difficulty. During September the work stoppage at The B. F. Goodrich Co.'s plants in Akron, O., resulting from an unauthorized and ill-advised strike by the members of the Foremen's Association of America, which indirectly prevented work by the members of the local URWA union, involved the largest number of employes of any of the work stoppages in the rubber field. In mid-September the URWA joined with other CIO unions in announcing that it would demand a general wage increase for all of its estimated 300,000 members in order to maintain a take-home wage for rubber industry workers at a wartime level in spite of the reduction in hours of the work week from 48 to 36.

The Goodrich Foremen's Strike

About 1,000 foremen of the Goodrich plants in Akron began a strike on September 3 in order to force the company to recognize the local union of the Foremen's Association of America as a bargaining agent for the foremen at these plants. The FAA had petitioned the NLRB for recognition as the bargaining agent for Goodrich foremen, but since no action had resulted before the foremen started their strike and since no election had been held, the local of the Foremen's Association of America at Goodrich was without legal status under the Wagner Act.

On September 7 in a half-page advertisement in the *Akron Beacon Journal* the Goodrich company reviewed its policy on this foremen's strike and denied charges that "wholesale layoffs" of foremen had caused the walkout.

Charges by the Goodrich chapter of the FAA, which called the strike, that the company refused to discuss grievances with foremen were likewise denied.

"The company has had close and friendly relations with its foremen for many years," the statement said in part.

"Like other members of management, foremen have been and are free to discuss all matters with the company at any time.

"When and if an election is ordered by the federal government, through the NLRB, and Local 98, FAA, is certified as sole bargaining agency for all our foremen in Akron, and this certification is approved by the courts, we will negotiate with representatives of the FAA. In the meantime we will continue to deal as before with foremen as individual members of management.

"We consider the calling of this strike and the proposed unionization of foremen to be entirely unjustified and detrimental to the best interests of foremen as well as all other employes, the community and the nation's program for reconversion and maximum employment," the statement added.

At a meeting with Paul Fuller, resident conciliator for the Department of Labor, on September 6, the foremen outlined their demands for settlement of the strike. They included a demand for one 6½-hour shift per day for foremen, a halt to layoffs while parttime foremen are used, halting of demotions of shift and floor foremen, establishment of foremen's seniority, a protest against bringing in foremen from the Goodrich plant in Texarkana, Tex., setting up machinery to handle foremen's grievances, and that all foremen be returned to their jobs without prejudice when the strike is ended.

Meanwhile direct production workers and members of the local URWA were caught in the middle, since they were not on strike, but could not work without adequate supervision, even if they were willing to cross the FAA picket lines. International URWA union officers advised officers of the Goodrich local to instruct its members to return to work; the local union officers first voted not to work until they had supervision and then on September 16 voted to return to work as soon as arrangements for opening the plants could be made. The company agreed to pay on a reporting-to-work basis in the event no

supervision was available when the plants reopened.

Finally on September 25, members of the local FAA voted unanimously to return to their jobs on the following day.

Final NWLB Decision on Firestone Accepted

The National War Labor Board announced on September 2 a unanimous decision involving the Firestone Tire & Rubber Co., Akron, O., after the company and the United Rubber Workers, CIO, had agreed at a conference with Board officials to accept the terms of the decision. The order directed continuation of the standard voluntary maintenance of membership clause, with an escape period ending September 15, and automatic check-off, and settled 21 other issues in dispute. The company withdrew its objections to maintenance of membership which were based on a strike which lasted from July 1 to 16. The new agreement is to remain in effect until July 1, 1946. Both parties agreed to defer consideration of a general wage increase until the NWLB develops its policy on general increases in dispute cases so as to enable the parties to negotiate. On the question of intra-plant inequities and the elimination of piecework from certain departments of the plant, both parties agreed to have their claims heard by a NWLB panel and to be considered under the Board's new wage policy.

The present standard work schedule and work-week of six hours a day and 36 hours a week is to be continued, and any basic change in the standard work schedule is to be negotiated between the company and the union.

The company's practice of compensating overtime work after eight hours a day and 40 hours a week at time and one-half was continued by the Board's order. The union requested that overtime be paid after six hours a day and 30 hours a week. The Board ordered double time to be paid for all work performed on six holidays and time and one-half for Sunday work.

URWA Wage Increase Campaign

The International URWA on September 14 announced that it will advise its local unions to demand of their respective rubber company employers the following changes from present wage contracts: (1) a basic 30-hour work week; (2) time and a half for all hours worked in excess of six hours a day and 30 hours a week and for work done on Saturdays; (3) double time for work performed on Sundays and six designated holidays and straight time for six holidays when they are not worked; (4) a night-shift differential of 10¢ an hour extra for night-shift work.

URWA president, Sherman H. Dalrymple, said the union does not believe its wage demands would necessitate an increase in the price of tires and other rubber products because of the industry's wartime increase in prices and in production due to greater mechanization and, finally, because of the fact that the industry now has synthetic rubber with which to curb serious fluctuations in the price of foreign-controlled natural rubber. He also said that wages comprise only 20% of the total production cost in the rubber industry.

In a statement expanding upon its new wage policy, the URWA said in part:

"Living costs have continued to climb.

"Moreover, employes throughout the rubber industry have sustained a drastic reduction in straight time earnings and have likewise sustained a loss by reason of the abrupt discontinuance of overtime work.

"The rubber industry is today in the most fortunate position it ever occupied. It is recognized that the cost of rubber constitutes about 30 to 40% of the ultimate cost of the finished product. Heretofore, the industry has been faced with wide fluctuations in the cost of natural rubber ranging from a few cents a pound to over $2 per pound.

"That uncertainty of price has now been removed. By reason of the exigencies of war, rubber production facilities for the production of synthetic rubber have been built by the government at a cost of $700,000,000 to the people of America. These rubber-producing facilities will prevent the uncertainty of price fluctuations in the future."

WPB Eases Rubber Order

All restrictions on the number of passenger automobile, motorcycle, and bicycle tires that may be manufactured were removed September 5 by Amendment 4 to R-1, which deleted section 4600.10, "tires and tubes," from the order. This action supplemented the cancellation of directives as to the amount of cotton authorized for these tires. Production of passenger-car tubes and small truck tubes, 6.00-16 and 6.50-16, was also removed from quantitative restriction by the same action.

Production percentage directives were removed on all truck tubes. Producers may now book orders without regard to usage. Previously manufacturers had to book certain percentages of their production for military replacement and original equipment.

Control of spare tires for new cars was transferred to OPA under Amendment 109 to RO 1-A, effective September 1. It is understood that OPA will not allow new tires for spares or fifth wheels until the demand for rubber for rolling wheels is more nearly in line with the supply.

The tire allotment plan governing the production of truck, bus, tractor, implement, and industrial tires has been revoked by the revocation of Appendix IV to R-1, effective September 7. The tire allotment plan was in effect for nearly two years and outlined the procedure by which the Office of the Rubber Director and later the Rubber Bureau controlled the production and distribution of the above classes of tires. This revocation eliminates the requirement that manufacturers of original (new) equipment obtain a tire allocation from WPB. There is no change in the procedure for purchase of replacement tires. Part B of the tire rationing certificate must still be turned over to a tire manufacturer in order to obtain shipment of replacement tires. There is no change in the procedure to be followed by drivers in acquiring passenger, truck, and bus tires still rationed under OPA regulations. Unaffected by the revocation are airplane, passenger-car, and motorcycle tires.

Tire manufacturers were released, by Amendment 7 to Appendix II of R-1, issued September 13, from government control of the size and kind of tires they may produce, but they must stick to a single quality in each size. Restrictions governing the manufacture of truck and bus tires and tubes, including the so-called "production pattern", have been removed. Butyl (GR-I), moreover, has been made available for large-size passenger-car tubes for the first time. Besides natural rubber specifications of some special-purpose tires were changed.

Amendment 7 provides that only one quality of tire may be made in each size, a "100 level" tire. This restriction, adhered to during the war by manufacturers, is being kept to attain maximum production rapidly. No premium grades and no tires of lower than the standard quality may be produced. All types of pneumatic tires will continue to be made with black sidewalls only.

Elimination of the "production pattern", which followed the removal of the tire allotment plan, makes it possible for manufacturers to exercise their own judgment in scheduling their production to meet civilian needs. Heretofore they had been required to use such of their facilities as were interchangeable on a preference basis to assure production of the most needed sizes and types.

All inner tubes 6.50 and larger in all rim sizes may now be made with Butyl owing to increased supplies of this special-purpose synthetic rubber. The 6.00 and smaller sizes will continue to be made of GR-S, the general-purpose synthetic rubber.

While the amount of natural rubber permitted in the manufacture of some tires has been reduced, the quality of so-called rock service and logger tires has been improved by permitting a 25% increase in the amount of natural rubber that may go into them. The changes were made in accordance with WPB policy of using available supplies of natural rubber where most effective. On the other hand the natural rubber content of certain military tires has been reduced following Ordnance Department tests which showed that satisfactory service would result. The most important change affected mud and snow tires, 10.50 by 18 10-ply and 14.20 12-ply, which hereafter will be made with S-4 synthetic construction calling for 90% synthetic rubber. In addition two sizes of large mud and snow tires, 24.00 by 28 24-ply and 30.00 by 32 28-ply, may now be made with S-7 construction, which is 35% synthetic rubber.

The natural rubber content of band tracks for Army half-track vehicles is changed from 40 to 30% in another paragraph of Amendment 7.

Table A of List 8 in Appendix II has been altered to incorporate a change previously announced permitting the use of high-tenacity rayon tire cord instead of cotton cord in small truck tires, 7.50 cross-section, 6 and 8-ply.

Other Restrictions Eased or Cancelled

More rosin will be available for civilian purposes as a result of an amendment to Order M-387, whereby all Schedule B industries have been reclassified as Schedule A industries and have been assigned higher quotas. Schedule A industries are those granted an overall quota from which both military and civilian orders must be filled; while Schedule B industries are granted quotas for civilian orders only, with military orders filled as "preferred" extra-quota orders. Under Schedule A the rosin previously available for military usage will automatically become available for civilian usage, WPB said.

WPB recently killed all its orders and directions relating to the following: aromatic solvents, formaldehyde and paraformaldehyde, hexamethylenetetramine, acrylic monomer, acrylic resin, styrene and dichlorostyrene, polystyrene and polydichlorostyrene, xylene (xylol), methyl isobutyl ketone, acetic acid, acetic anhydride, acetaldehyde, acetylene black, diphenylamine, polyethylene, ethyl cellulose, carbon tetrachloride, casein, protective coatings, chlorine,

STATEX

CONTRIBUTES MANY ADVANTAGES

In

GENERAL PURPOSE COMPOUNDING

COLUMBIAN CARBON COMPANY

• A COLUMBIAN COLLOID •

400 TONS OF SMOKE A DAY

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STATEX-93

for **FOOTWEAR**

Shoe uppers compounded with Statex-93 exhibit high elasticity and good abrasion resistance. With Statex-93 it is possible to develop uppers richer in GR-S. These run smoothly at the calender and do not blister even in heavier gages.

For soles and heels Statex-93 produces stocks which handle very easily with a minimum of shrinkage.

for **WIRE JACKETS**

Easy dispersion; smooth, rapid extrusion; compounds which hold accurately to gage are advantages resulting from the use of Statex-93. The high pH of Statex-93 favors rapid vulcanization with a minimum of activation. Loadings as high as 50 to 60% produce covers with good tensile strength and abrasion resistance.

for **MECHANICALS**

In this category the performance of Statex-93 is exceptional. It smooths out stocks so that they extrude accurately to gage with minimum distortion on cooling and promotes fast curing.

In motor mountings and similar items where dynamic stress is the essential factor Statex-93 offers resilience with resistance to deflection under load. The ability of Statex-93 compounds to stand up under elevated temperatures suggests it as the carbon for high-speed belting and conveyor covers.

STATEX-93 makes it possible to combine top quality with good processing and accomplishes all around economy.

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peroxygen chemicals, toluene, benzene, alkyl amines, carbon black, urea and melamine aldehyde resins, aniline, synthetic organic detergents, vinyl polymers, phthalic alkyd resins, mica, phosphate and phthalate plasticizers, methyl ethyl ketone, phthalic anhydride, yellow iron oxide, natural resins, asbestos, asbestos textiles, acetone, diacetone, coumarone-indene resins, talc, industrial-type instruments, control valves and regulators, liquid level controllers, pyrometers, resistance thermometers, indicating dial-pressure gauges, rubber processing machinery and equipment, camelback, laboratory equipment, cotton duck, dyestuffs, organic pigments, zinc oxide, motor trucks and truck trailers, replacement storage batteries, motorcycles, rubber yarn and elastic thread, anti-friction bearings.

Cancellation of 400 out of a total of 492 emergency alternate federal specifications, devised to provide substitutes for critical materials used in items purchased by the goverment during the war, was announced September 6 by the WPB, which said that these emergency specifications had been developed at the suggestion of the Conservation and Salvage Division, working in collaboration with the 73 regularly constituted technical committees on federal specifications. The substitution effected resulted in a substantial saving in critical materials needed in war production and thereby materially contributed to the maintenance of such production. Eighty-five additional emergency specifications are in process of cancellation or will be incorporated into basic federal specifications where they have been found to be superior to the former product. The remaining seven will be retained until tin, burlap, rubber, and other materials become more plentiful.

All wartime import shipping quotas have been eliminated because of the eased shipping situation, WPB, the United States Department of Agriculture, and WSA jointly announced September 11. A simplified system of priority preference ratings, however, will be maintained to insure that commodities and materials important to reconversion and food programs, or still needed by the Armed Forces, will be given preferential treatment. Imports of materials still subject to orders WFO-63 and M-63, however, will still have to be authorized in the usual manner, the agencies pointed out.

Industry advisory committees of an overall type will be retained on an "on call" basis until the War Production Board is liquidated, WPB announced September 7, in issuing supplementary rules to govern its advisory groups. During the present demobilization and reconversion period, certain industry committees that represent segments of major industries will be dissolved, but overall-type committees will continue to function.

The agency emphasized that it would continue to seek the advice of industry members whenever new plans affecting production are to be formulated or changed. WPB will continue to schedule meetings whenever any three committee members make the request and the proposed agenda concerns WPB.

WPB also announced that certificates of appreciation will be forwarded to 8,000 members of the 792 committees now active as well as to industry members formerly associated with the agency's advisory groups since the first one was formed late in 1941. Each certificate will express the appreciation of J. A. Krug, WPB chairman, for "loyal service to a grateful nation."

Pricing Set on New Rubber Footwear Items

Eighty-five items of rubber footwear not made during the war, but now about to be produced again have been provided with dollar-and-cent ceilings for sales by manufacturers under Amendment 11 to MPR 132—Rubber Footwear—effective September 24, 1945. Retail ceilings for these items, which represent a wide variety of rubber boots, waders, rubbers, etc. for men, women and children, will be established before the items reach store counters, OPA said. Compared with prewar prices for the same items made of natural rubber, the new ceilings are, on average, 8.9% higher. This increase is allowed because the items are now made from synthetic rubber, which is more exepnsive to use in the making of rubber footwear than the prewar natural rubber. Before deciding on the price ceilings, OPA consulted with members of the industry and carefully considered their recommendations, the agency declared.

Amendment 1 to Order 4, MPR 132, authorizes maximum prices for a man's five-buckle rubber arctic, an all-rubber knee wader, and a man's calendered-sole training shoe (canvas footwear).

Amendment 1 to Order 5, MPR 132, establishes maximum prices for sales at all levels of trade of the neoprene dipped footwear item, "Shower Toes," made by the Perry Rubber Co., Massillon, O.

Shoe repair shops are permitted to charge 5-15¢ a pair over their regular prices for the soling of shoes when they use two types of soling materials now coming on the market, neolite and brown composition, rubber or fiber, to compensate for the higher costs of these materials, according to Amendment 3 to Supplementary Service Regulation 47 to RMPR 165—Retail Shoe Repair Services—effective September 10, 1945. Neolite is an entirely new material; while brown composition, rubber or fiber, soles are similar to brown soles of these types sold before the war, except that synthetic rubber is now used in place of natural rubber. During the war repair shops used either leather or black composition, rubber or fiber, soles. For brown composition, rubber or fiber, half or full soles, an addition of 15¢ a pair, is permitted over the legal ceiling price for black composition soles.

Amendment 2 to Supp. Service Reg. 60, RMPR 165, adds to SSR 60—Certain Services in the Territory of Hawaii—ceilings for certain retail shoe repair services sold on the Island of Oahu only, including those on rubber soles and heels.

Order 5, MPR 200, sets ceilings for sales in the shoe repair trade of super-grade women's 10½ iron black and brown composition half soles bearing the brand name Cat's Paw Twin Gripper and made by Holtite Mfg. Co., Inc., Baltimore, Md.

Amendment 22 to MPR 200 amends item 11 of Table I-A, prices for black or brown ski heels.

Order 3, RMPR 229, authorizes maximum prices for wholesale and retail trade within the continental United States of canvas-topped, calendered rubber-soled basketball shoes of vulcanized construction imported from Cuba.

Order 6, MPR 260, establishes ceiling prices for women's competitive-grade brown ⅝-inch wedge heels, style No. 600, maunfactured by Webster Rubber Co., Sabattus, Me.

A method for establishing ceilings for manufacturers' sales of molded rubber light-colored heels and soles in red, white, ivory, green, yellow, and blue appears in Amendment 13 to MPR 477—Sales of Rubber Heels and Soles in the Shoe Factory and Home Replacement Trades—effective September 24, 1945. Manufacturers' maximum prices for these items when sold to manufacturers of shoes, may be obtained by adding differentials varying from ½¢ to 5¢ per pair to the ceilings established for brown heels and soles. In most cases these differentials are the same as those in effect during the Fall of 1941. However, because of greater difficulty and expense in making red soles from Buna instead of natural rubber, the differential for men's, women's, and boys' red soles is a half-cent a pair more than the base period differential. In the few cases when an item was not produced, or was made only in limited quantities during the Fall of 1941, the differentials are in line with the differentials on comparable items.

Manufacturers' ceilings are also established by the amendment for colored toplift strips, composition soling slabs, and fiber slabs.

Order 57 under 3(e), Amendment 1, sets ceilings for Neolite half soles and toplift strips made by Goodyear Tire & Rubber Co., Akron, O.

Rationing of industrial rubber footwear ended September 5 with the revocation of RO 6A—Men's Rubber Boots and Rubber Work Shoes. The following six types were rationed: hip height boots, above knee height boots, below knee height heavy boots, below knee height light boots, mine pacs, bootees and other footwear in this class 10 inches or more in height, and pacs, bootees, and work shoes below 10 inches in height.

Production schedules for 1945 call for approximately 3,000,000 pairs of these six types of rubber footwear, 1,250,000 more pairs than were turned out last year.

During the first half of this year, output improved considerably. Production reached almost 1,300,000 pairs, about 60% more than in the same period of 1944. Now that the war is over and military need for rubber and rubber footwear is falling sharply, production estimates have risen, and we expect to be only 500,000 pairs short of the 1942 output. So far, production is about 5% behind schedule, but it should pick up immediately and remain high for the remainder of the year.

Other Rubber Goods Affected

New methods have been established for determining manufacturers' and wholesalers' ceilings for industrial rubberized fabric gloves by Amendment 21 to MPR 220—Certain Rubber Commodities—Amendment 2 to RMPR 300—Rubber Drug Sundries—and Amendment 2 to RMPR 301—Retail and Wholesale Prices for Rubber Drug Sundries—all effective September 29, 1945. The new methods are provided by removing the gloves from the rubber drug sundries' regulations and placing them under the regulation covering certain rubber commodities, which include items distributed through the same channels used in the sale of industrial rubberized gloves. This action will not generally affect prices to consumers, who are mainly industrial users. These gloves, made of fabric and then dipped in rubber, are not usually sold at retail.

Manufacturers will be permitted to use their March, 1942, prices for these gloves, less the reduction in their neoprene costs since that date. Previously the base date had been December, 1941. The change will

generally increase prices at the manufacturing level.

Wholesalers will be required to use their March, 1942, margins instead of specified margins allowed heretofore. This policy will result in generally lower margins for wholesalers, which will offset the increase in manufacturers' prices.

Order 115, MPR 220, revokes the following orders which had previously established the manufacturer's and resellers' ceilings for bathing or shower caps: No. 103, M. Ailetcher & Co., Lakewood, N. J.; No. 105, M. L. Harvey Co., New York, N. Y.; 106, Universal Latex & Plastics Corp., Avenal, N. J.; 108, Edelco Rubber Co., New York; 109, S. Buchsbaum & Co., Chicago, Ill.; 110, White Products Co., New York; 111, Aviatrix Co., New York; and No. 112, Parker, Stearns & Co., Inc., Brooklyn, N. Y. New pricing arrangements also are included in Order 115.

OPA by Supp. Order 129 exempts from price control a long list of products including bust forms and fillers (other than surgical) made wholly or partly of crude, synthetic, or substitute rubber. Suspensions of price controls for an indefinite period were also indicated for many items including heavier and lighter than air aircraft and parts therefor including any product upon which further fabrication need not be performed to complete its identification as a part specially designed for the production or repair of aircraft, but excluding specifically such items as airplane tires and tubes.

Order 15, RMPR 300, authorizes maximum prices for neoprene ear protectors known as "Silents" and made by M. C. Rosenblatt, New York, N. Y.

Amendment 1 to Order 14, RMPR 300, authorizes maximum prices for large and small air mattresses and air pillows, products of K. & W. Rubber Corp., Delaware, O.

Amendment 18 to MPR 149, effective August 6, established uniform dollar-and-cent ceilings for bare cut neoprene rubber thread. These maximum prices are generally lower than those that prevailed previously. Amendment 20 to MPR 220, effective September 24, requires manufacturers to reflect the decreased prices of this thread in computing their maximum prices for elastic webbing, braid, and cord made wholly or partly of this rubber thread.

Though the ceilings for other rubber threads used in producing elastic webbing, braid, and cord have not been reduced, it is believed that similar reduction may be made in the existing maximum prices for some of these other rubber threads. Accordingly, Amendment 20 requires the manufacturer of elastic webbing, braid, and cord to use in his computations the prices in effect to him for other rubber threads in effect to him at the time he computes his maximum prices so that any lower ceilings by manufacturers of these threads will also be reflected in reduced prices for the elastic webbing, braid, and cord.

An order is being issued which revokes all maximum prices for elastic webbing, braid, and cord made wholly or partly of bare cut neoprene rubber thread that were established prior to this amendment. Therefore manufacturers of elastic webbing, braid, and cord who used the previously existing higher maximum prices for bare cut neoprene rubber thread in computing their ceilings for elastic webbing, braid, and cord will be required to recompute their maximum prices and reflect the lower prices of these threads in their elastic webbing, braid, and cord prices. Similar orders will be issued if the existing ceilings for other rubber threads are reduced.

Order 79, SO 94, establishes maximum prices at which certain new Navy raincoats may be sold by the United States Department of Commerce and by any subsequent reseller.

SO 94, Rev. Order 38, exempts from price control sales by any government agency and by any subsequent reseller of life rafts and life floats other than pneumatic life rafts and life floats.

Order 72 under 3 (e), GMPR, establishes ceilings for sales of Army rejected 10-man pneumatic boats manufactured by the Goodyear Tire & Rubber Co., Akron.

Order 75 under 3 (e) applies to ceilings for all sales of GR-S sponge-rubber makeup puffs of Davidson Rubber Co., Charlestown, Mass.

Order 76 authorizes maximum prices for all sales of Rug-Tex, a synthetic rubber-like solution containing GR-S latex type 3, manufactured by California Housewares Co., Los Angeles, and used on the back of rugs to prevent slipping.

Order 114, MPR 220, sets ceilings for P1953 Bostik cement manufactured by B. B. Chemical Co., Cambridge, Mass.

Order 4428, MPR 188, sets ceilings for dish drainer baskets made by The Wooster Rubber Co., Wooster, O.

SO 44, redesignated RSO 44—Applicability of Maximum Price Regulations to Hawaii—issued August 27, makes all price regulations and schedules issued by OPA inapplicable to the Territory except for 63 regulations including: MPR 21—Formaldehyde; MPR 36—Acetone; MPR 37—Butyl Alcohol and Esters Thereof; RPS 56—Reclaimed Rubber; RMPR 119—Original Equipment, Tires and Tubes; RMPR 143—Wholesale Prices for New Rubber Tires and Tubes; RMPR 180—Color Pigments; MPR 415—Certain Federal Government Purchases of Rubber Tires and Tubes; and MPR 435—Bicycle Tires and Tubes.

MPR 234—Approved Stirrup Pumps—was revoked September 18 as these products are being disposed of by the Defense Supplies Corp. subject to the provisions of Supplementary Order 40.

Charges for splitting tires may be made on an adjustable pricing basis pending establishment of uniform dollar-and-cent ceiling prices for this service, according to Order 46 under Section 17 of RMPR 165—Authorization of Sales at Adjustable Maximum Prices—effective September 5. Formerly charges for this service had been frozen at March, 1942, levels. Requests have been made by the industry for an increase in these ceilings, and studies are being made to determine fair and equitable specific maximum prices. To encourage the continuance of this service pending establishment of the new ceilings, OPA will permit adjustable prices. Actual payments in the meantime cannot be made above present ceilings, but, if the new ceilings to be established are higher, the difference then may be collected.

The following orders have been added to RMPR 528—Tires and Tubes, Recapping and Repairing, and Certain Repair Materials — authorizing maximum retail prices for the new products indicated: No. 60, one truck and bus, one mud and snow, and five combat and run-flat tires, made by The Goodyear Tire & Rubber Co., Akron, O.; No. 61, synthetic rubber Life Protector special-purpose passenger-car tubes, Firestone Tire & Rubber Co., Akron; No. 62, four replacement combat and run-flat tires of cotton construction.

Order 30, RMPR 131, applies to sales of reliners, patches, and/or boots made from scrap materials and sold to jobbers, mail-order houses, and chain-store systems of more than 25 units, the maximum prices on which transactions were established prior to August 7, 1945, under subparagraph (5) of section 5a (c) of RMPR 131.

Order 4355, MPR 188, approves ceilings for an automobile tire pump made by Peterson Mfg. Co., Kansas City 1, Mo.

Amendment 2, RO 1B—Mileage Rationing; Tire Regulations for Puerto Rico—revises some of the rules on the issuance of certificates for tires.

Amendment 4, Rev. RO 1C—Tire Rationing Regulations for Virgin Islands—changes the words "OPA Form R-2" to "OPA Form R-2a" and deletes farm and industrial tires from rationing.

Amendment 1, Rev. RO 1E—Mileage Rationing; Tire Regulations for Hawaii—eases tire eligibility rules.

Amendment 25, RMPR 373—Tires and Tubes in Hawaii—transfers the listing on a 11.00-20 tire from Table C-II under Appendix C of Section 23 to Table C-III.

Heyden Chemical Corp., 393 Seventh Ave., New York 1, N. Y., has named as assistant secretary S. Askin, industrial relations director.

Petroleum Administration for War, Washington, D. C., last month revoked three wartime restrictions on natural gas and gas condensate, Petroleum Recommendation 13 and 35 and Directive 79; the last restricted the use of butane as a fuel in well-drilling operations because it was needed in the manufacture of synthetic rubber and aviation gasoline as well as for other special processes.

Later in the month PAW revoked also Recommendation 31—Manufacture of Butadiene—and Directive 52—Synthetic Rubber. These revocations, however, were both effective as of August 15.

Thermoid Co., Trenton, N. J., has appointed two new district managers in its industrial rubber products division. Oscar Nuss will serve the Southern California, New Mexico, and Arizona areas, with headquarters at the Thermoid of California plant in Los Angeles. He came to the company in January, 1945, when Thermoid acquired the Los Angeles plant of Grizzly Mfg. Co.

Walter Chick, as district manager of the Northwest Pacific Coast area, with headquarters at the firm's San Francisco branch office, 895 O'Farrell St., has been with Thermoid for more than ten years, recently as sales-service manager of the automotive replacement division, for two years, and for eight years prior as San Francisco district manager of the division.

National Association of Waste Material Dealers, Inc., Times Bldg., New York 18, N. Y., will hold a streamlined fall convention at the Hotel Sherman, Chicago, Ill., October 24 and 25 to give the industry, which has been unable to get together for some time, an opportunity to consider problems which it will face during the postwar era. Theme of the convention will be: "What's Ahead for the Waste Material Industry?"

EASTERN AND SOUTHERN



Carl W. Snow

Snow Joins United Carbon

United Carbon Co., Charleston, W. Va., has appointed Carl W. Snow research supervisor at the recently completed laboratory as well as the pilot plant at Borger, Tex. Mr. Snow, 39 years of age, is a graduate of the University of Colorado with a chemical engineering degree and has also had advanced graduate study. For the past ten years he was associated with General Atlas Carbon Co. as chief chemist, has specialized in the manufacture of furnace process carbon black, and is credited with a number of patents on the manufacture and pelleting of this type of black. Mr. Snow is married and has two children. He will reside at Borger.

D. R. Wallace and A. L. Sweigart, formerly laboratory technician and research chemist, respectively, with General Atlas at Pampa, have joined the United Carbon research division at Borger.

First Machinery Corp., 819-37 E. Ninth St., New York, N. Y., is liquidating immediately its entire stock of new, rebuilt, and used chemical and process equipment because the New York Housing Authority has condemned the company's building to make way for a new housing project. Rather than undertake the extremely costly expense of moving tons of equipment to a new location, First Machinery Corp. is holding this liquidation sale. The firm is not going out of business, however, and will announce the site of its new quarters in the near future.

The American Tariff League, 19 W. 44th St., New York 18, N. Y., on August 31 elected as president H. Wickliffe Rose, assistant to the president of American Viscose Corp., New York. Second vice president is August Merz, of Calco Chemical Division, American Cyanamid Co., Bound Brook, N. J. Among others on the board of managers are: Elvin H. Killheffer, of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.; Andrew H. Phelps, vice president, Westinghouse Electric Corp., East Pittsburgh, Pa.; and Howard I. Young, president, American Zinc, Lead & Smelting Co., Columbus, O.

"Du Pont and the War Effort"

Originally organized to give employes of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., a picture of the ways in which their work contributed to victory, an exhibit showing the many ways du Pont materials were used in products for the Armed Services was thrown open to the public at the Hotel Du Pont in Wilmington during September. Seldom, if ever, has the public seen, in a single room, so many chemical products in their final usable form, as airplane tires, storm suits, tents and hammocks, compass housings, plastic windows, and sponges that hold gasoline, but not water. A number of items in the exhibit, which was arranged by the du Pont advertising department, have until very recently been on the "classified" list and are being displayed for the first time.

Since this company does not, in most cases, fabricate the finished articles displayed at the exhibit, du Pont stated that it was impossible to say how or when some of the wartime developments will appear on the civilian scene.

Neoprene synthetic rubber was displayed in a spectacular way in the form of a bridge pontoon made of neoprene-coated fabric. The pontoon is 33½ feet long and nine feet wide and with the extra center portion will sustain a weight of 18 tons. A big pneumatic lifting bag for jacking up B-29 bombers or other planes that have become bogged down in soft or swampy landing places is also made of neoprene. The bag, five feet square, is about six inches thick when deflated. Inflated, it rises to a height of five or six feet, and each bag has a lifting capacity of 12 tons. Other neoprene applications shown included flooring material used on destroyers, a plywood molding bag, and industrial gloves.

Nylon was displayed in a variety of forms. More than 500 pounds of nylon cord are contained in the giant military tire on exhibit. The tire has a tread of 44 inches and weighs 1,500 pounds. In the textile field were shown flying suits, stormproof tents, featherweight "canvas" for army cots, gloves, and shoe laces. Also exhibited were nylon plastic "flak vests" and nylon-coated wire.

The use of polyethylene for insulation of wire for radar and television was shown, and of special interest was assault wire insulated with this material and then coated with nylon plastic.

There were many items of clothing on display made from fabrics coated with du Pont's "Buatacite" polyvinyl butyral plastic. Other plastic products exhibited were "Lucite" methyl methacrylate bomber noses and fighter plane canopies, as well as nylon-bristled paint brushes.

Numerous other items from organic chemicals, pigments, and explosives departments of the du Pont Company were included to show the great diversity of a chemical company's activities.

Sanders-Eavenson Chemical Co., 55 Liberty St., New York, N. Y., recently was organized to serve as distributer of products to the rubber, leather, textile, food, metal cleaning, and hospital trades. James W. Sanders previously had been executive vice president of Plastics Moulding Corp., and Marvin S. Eavenson, Chicago manager of Wyandotte Chemicals Co.

Controllers Institute of America, 1 E. 42nd St., New York 17, N. Y., has announced the election of the following as directors of the Controls indicated: Wilfred L. Larkin, vice president and treasurer of Boston Woven Hose & Rubber Co., and Frederick L. Patton, assistant to the president of Cambridge Rubber Co., Boston Control; G. W. Lishawa, treasurer of Master Tire & Rubber Corp., Toledo Control; Arthur Surkamp, treasurer, United States Rubber Co., New York, N. Y., Control; and P. L. Hockman (reelected), assistant treasurer, O'Sullivan Rubber Co., District of Columbia Control.

Schatzel Now with Rome Cable

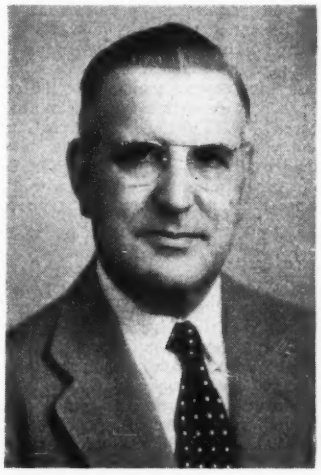
Rudolph A. Schatzel has joined Rome Cable Corp., Rome, N. Y., as vice president and director of engineering. He had recently been director of research for General Cable Corp., Bayonne, N. J.

He was born August 14, 1895. After graduation from Union College, Schenectady, N. Y., he went into the research laboratory of General Electric Co., but later served as an instructor at Union College. Granted a fellowship, he continued graduate work at Massachusetts Institute of Technology. Then in July, 1924, he entered the employ of Rome Wire Co., where he remained 18 years.

Mr. Schatzel is one of the group of scientists who recently returned from Europe after making a study of the German industries. During the war he also served on many government committees. Besides he is the author of many technical papers and has taken out several patents on wires and cables.

The Rome company vice president, moreover, is a Fellow of the American Institute of Chemists and a member of the crude rubber committee of the American Chemical Society. He is active in the affairs of the American Society for Testing Materials and the New York Rubber Group. Other organizations to which he belongs are: American Institute of Mining & Metallurgical Engineers, American Institute of Electrical Engineers, British Institute of Metals, Institution of the Rubber Industry, Insulated Power Cable Engineers Association, Sigma Xi, Chemists Club of New York, Teugega Country Club of Rome, and Lambda Chi Alpha.

With his wife and daughter Mr. Schatzel will live in Rome.



R. A. Schatzel

Hercules Appointments

Hercules Powder Co., Wilmington, Del., has elected Wm. R. Ellis and Mahlon G. Milliken vice presidents and members of the executive committee; while Vice President Philip B. Stull has also been named to the committee. Mr. Ellis, who came to Hercules in 1915, has been general manager of the explosives department since 1936 and a director of the company since 1937. Mr. Milliken, with Hercules since 1915, has served as general manager of the cellulose products department since 1934 and as a director since 1936. Vice President Stull has held that office since 1943; he had been president of the Virginia Cellulose Co., Hopewell, Va., when it was acquired by Hercules in 1926. Succeeding the two new vice presidents to their respective posts in the explosives and cellulose departments are J. B. Johnson and John J. B. Fulenwider, both of whom had been assistant general managers in their respective departments.

Hercules has appointed L. W. Babcock director of personnel. He had been assistant director of operations of the explosives department since July, 1940, and with the company since 1917.

David M. Houston has been made director of the Hercules export department, replacing Theodore M. Switz, resigned. Mr. Houston, with the company 21 years, recently served as manager of sales for cellulose products, synthetics, and naval stores departments, with headquarters in San Francisco.

Richard T. Yates, Jr., has been appointed assistant director of sales of Hercules Powder's naval stores department. Previously he had been manager of domestic sales of the department. He became affiliated with Hercules in June, 1929, after graduating from Virginia Polytechnic Institute, and was assigned to experiment station as a chemist and in 1930 was transferred to the sales division of naval stores. In 1934, Mr. Yates was named supervisor of rosin sales, in 1939 supervisor of vinsol resin and truline binder sales, and in 1940, manager of domestic sales.

B. H. Champion has been named assistant superintendent of Hercules synthetics department plant at Mansfield, Mass. He will be assistant to D. A. Bunce, plant superintendent. Mr. Champion, who joined Hercules in November, 1940, as a member of the engineering staff at Radford Ordnance Works, Radford, Va., lately has been working on engineering problems at the Mansfield plant.

Edward G. Crum, plant manager of the cellulose products plant at Parlin, has been made assistant general manager of the cellulose products department in Wilmington to succeed Mr. Fulenwider. Mr. Crum also will continue to discharge the duties of manager of the Parlin plant for the present. He has been associated with the plant since 1928 and has been manager since 1941.

Expansion Projects

Hercules plans increasing production of soluble nitrocellulose 1,000,000 pounds monthly at its Parlin, N. J., plant, by utilizing equipment used in military production at the plant, with the addition of new dehydration and distillation apparatus. Work on the conversion is being rushed to completion, and it is expected a part of the new installation will be ready for production early in October. The company's plant expansion is necessitated by increased demands for Hercules' soluble nitrocellulose, which is the base for quick drying lacquers, nitrocellulose plastics, coated textiles, etc.

Hercules on September 5 received approval of the Reconstruction Finance Corp. of the company's purchase of the B line nitrocellulose plant, adjacent to its Parlin plant. Also obtained was permission for the construction of necessary facilities to suit the present plant to Hercules production needs. The newly acquired facilities will be utilized primarily to increase the production of cellulose acetate. Other cellulose derivatives, which along with cellulose acetate are manufactured at the Parlin plant, may also be manufactured in the addition. New equipment must be installed since a different process will be carried on. Because of the uncertainty connected with the construction work, no date for the beginning of operations can be set.

Then on September 21, Hercules revealed a $200,000 expansion of its Mansfield, Mass., plant which will triple production of hard resins. The majority of this increase will go into the manufacture of Pentalyn Resins, the pentaerythritol esters of rosin, pioneered by Hercules. The additions to the Mansfield plant, begun in June, are now in operation. Part of the plant has been revamped for the production of new-type alkyd resins. A completely new boiler house will be completed in November. The new facilities for producing hard resins will also make possible the more rapid development of new resins and new types of resinous raw materials for the paint, varnish, and lacquer industry, the company said.

Hercules Powder announced September 21 a $1,250,000 addition to its naval stores plant at Brunswick, Ga, now under construction, is expected to be producing by April 1, 1946. The new unit will add approximately 3,600,000 pounds of rosin and resinous products and 720,000 pounds of liquid products to the plant's monthly output. The Georgia plant and the company's Hattiesburg, Miss., unit produce, at capacity rates, finished naval stores of all kinds in excess of 300,000,000 pounds a year.

Upon the completion of the new unit, Hercules wood naval stores production capacity will total more than 350,000,000 pounds of finished wood naval stores products each year, which is approximately 50 per cent of the nation's supply. A major portion of this supply will be used by other company departments in the manufacture of special chemical materials for industry.

Besides being one of the largest single producers of naval stores in the world, Hercules has pioneered in the research and development of many products which will be important in the reconversion of the nation's industry to peacetime production. Significant among these developments is Hercules Dresinate 731, which is making possible the production of superior synthetic rubber tires at a time when natural rubber is scarce. Even when it is again available, Dresinate 731 is expected to continue to play a prominent part in the rubber industry.

The Manhattan Rubber Mfg. Division, Raybestos-Manhattan, Inc., Passaic, N. J., has received two first awards from the National Advertising Agency Network at its twelfth annual competition held recently in Washington. One of these awards was for "Best Integrated Advertising and Merchandising Campaign", and the other was for "Employe Relations Program."

U. S. Rubber Announcements

United States Rubber Co., Rockefeller Plaza, New York, N. Y., has revealed that the rubber decoys it made played a vital role in the European war. The decoy targets were made to look exactly like regulation lightweight tanks, medium tanks, 90 mm. anti-aircraft guns, and 155 mm. guns. They were easily transported to combat areas because they were collapsible, easy to inflate or deflate and could be packed compactly. The usefulness of the targets depended upon large-size pneumatic rubber tubing; the production during the emergency was so much increased that U. S. Rubber workers were turning out daily five miles of tubing in addition to the finished decoy targets. The main object of the "rubber army" was to deceive German airmen by luring them to false targets while the real concentration of power was at other locations.

Production of "Lastex" yarn for girdles, hosiery, swimsuits, and other wearing apparel will be doubled by January 1, U. S. Rubber announced last month. Manufacturing facilities are being increased rapidly, with new plants and equipment, to meet pent-up demands for "Lastex" yarn. By June of next year, output is expected to surpass prewar levels, and it is expected that 25% more workers will be employed. The company at present is producing "Lastex" yarn in five plants: in North Carolina, New Hampshire, Massachusetts, and Rhode Island.

A new and comprehensive business development program geared to the requirements of the independent tire distributer is now in preparation by the U. S. Tires division, according to D. W. Walsh, sales manager. Designed to keep the distributer abreast of modern merchandising trends, the program covers every phase of successful sales and service operation to insure maximum volume and increased profits, he said.

T. J. Newton has returned to his former post in the company's tire engineering and service department at Detroit after a three-year leave of absence to do special work for the government in Washington. A native of Kansas City, Kan., and a graduate of the University of Detroit with a degree in mechanical engineering, Mr. Newton joined the development department of U. S. Rubber in Detroit in 1935. He was transferred to the tire engineering and service department in 1937, where he remained until July, 1942, when he was called to Washington to act as chief of the automotive section of the rubber branch of the Army service forces. He went to the Office of Rubber Director in February, 1944, and became assistant director of the Bureau in charge of technical operations in September, 1944.

The Fisk tire plant of U. S. Rubber has turned its tire production facilities from war to peace and by October 15 will increase passenger-car tire production by more than 50% over present output, T. E. Clark, plant manager, stated last month. Each succeeding month will see a steadily stepped-up output, and by year-end passenger-car tire production will reach prewar levels of manufacture, he said. Truck tires, made in high volume for military purposes during the war, are now being made for civilian use at greater than prewar rate of production, he added.

"Additional tire-building machinery and equipment already purchased and scheduled for installation this fall will add greatly to the capacity of the plant," Mr. Clark

declared. "Furthermore present indications are that volume production will be maintained at Fisk for some time to come."

When the reconversion program now in progress is completed, production at Fisk will be increased substantially over prewar output, including production of tires, inner tubes, and bicycle casings.

The plant already is employing more people than it did in prewar days: about 4,000 persons, as against a prewar figure of 2,583. With the accomplishment of the reconversion program, employment is expected to reach around 4,500 persons.

The company is likewise increasing production facilities at its other major tire plants, at Detroit, Mich.; Eau Claire, Wis.; and Los Angeles, Calif.; and a plant for making inner tubes at Indianapolis, Ind.

Turner Alfrey, research chemist of Monsanto Chemical Co., Springfield, Mass., is joining the staff of the high polymer research bureau of the department of chemistry at the Polytechnic Institute of Brooklyn, 85 Livingston St., Brooklyn 2, N. Y., to teach specialized courses in polymer chemistry and to engage in fundamental research in this field. Dr. Alfrey was the first Monsanto fellow at the institute where he took his doctorate in 1943. He holds the bachelor's and master's degrees from Washington University in St. Louis. During his connection with Monsanto, Dr. Alfrey continued as a part-time instructor at Polytechnic, giving courses in chemical physics and the mechanical behavior of high polymers. For the past year he has spent three days a week at Polytechnic working on the Quartermaster Corps project launched in conjunction with a panel of 60 leading manufacturers of plastics to perfect films and coatings for Army supplies and equipment. Dr. Alfrey's part of the work was a study of the effect of plasticizers on vinyl resins.

Portable Products Corp., Pittsburgh, Pa., has appointed E. D. Wacker general manager of its C. J. Tagliabue division, Brooklyn, N. Y., with which he has been associated 22 years, the last eight of which as general sales manager.

Major Albert K. Dannenbaum, research specialist on rubber, synthetic rubber, and coated fabrics at the Philadelphia Quartermaster Depot and in civilian life president of the Aldan Rubber Co. and the Schwarzwaelder Co. of Philadelphia, was tendered a testimonial dinner by The Rubber Manufacturers Association, Inc., at the Waldorf-Astoria Hotel, New York, N. Y., on September 26. Capt. Andrew B. Rawn, Jr., contracting officer for rainwear and equipage at the Quartermaster Purchasing Office in New York City, was also honored at the same time. Captain Rawn served as contracting officer at the Philadelphia Quartermaster Depot prior to his transfer to New York.

William Sellers & Co., Philadelphia, Pa., has established a hydraulic and special machinery division under the direction of John C. Graf, sales manager, and John B. Cutler, chief engineer, specializing in hydraulic presses and special equipment for ferrous, non-ferrous, plastic, and rubber fields. Messrs. Graf and Cutler bring to Sellers an experience covering 20 years in the development of molding presses of all types as well as special equipment and molds used in these fields.

Hewitt Rubber Corp., Buffalo, N. Y., recently acquired about 90% of the stock in Robins Conveyors, Inc., Passaic, N. J. In addition to directing the management of Hewitt since 1936 as president, Thomas Robins, Jr., has been chairman of Robins Conveyors' executive committee for the past five years, and there has been a close association between the two companies. Currently, Hewitt and Robins are furnishing lengthy conveyers in this country and abroad, particularly to Russia and South America. Mr. Robins said that Hewitt anticipates sales in the immediate postwar years to be substantially greater than their prewar level.

Hewitt has installed new equipment for one complete production line of its new latex foam products, and experimental production is under way, to continue for several weeks in order to familiarize employes with the new equipment and processes used in foam rubber manufacture. Actual commercial production will follow in the near future, depending to some extent on the installation of additional equipment. It is planned to install as rapidly as possible five full-scale production lines in a new plant adjacent to the company's present Kensington Ave. headquarters in Buffalo.

Newport Industries, Inc., Pensacola, Fla., plans new production facilities to help relieve the shortage of rosin. Contracts have been let for erection of a new plant at Oakdale, La., at an estimated cost in excess of $2,500,000. A second unit of this plant will provide new and additional manufacturing facilities for production of terpene chemicals and diversified products now being marketed by the company for many uses, such as in plastics, synthetic resins, and synthetic rubber. The Oakdale project, when in production toward the end of 1946, will employ about 400 men.

Fixed Government Prices*

	Price per Pound	
	Civilian Use	Other Than Civilian Use
Guayule		
Guayule (*carload lots*)	$0.17½	$0.31
Latex		
Normal (*tank car lots*)	.26	.43½
Creamed (*tank car lots*)	.26¼	.44¼
Centrifuged (*tank car lots*)	.27¼	.45¼
Heat-Concentrated (*carload drums*)	.29½	.47
Plantation Grades		
No. 1X Ribbed Smoked Sheets	.22½	.40
1X Thin Pale Latex Crepe	.22½	.40
2 Thick Pale Latex Crepe	.22	.39½
1X Brown Crepe	.21¾	.38¾
2X Brown Crepe	.21½	.38¾
2 Remilled Blankets (Amber)	.21¾	.38¾
3 Remilled Blankets (Amber)	.21¾	.38¾
Rolled Brown	.18	.35½
Synthetic Rubber		
GR-M (Neoprene GN)	.27½	.45
GR-S (Buna S)	.18½	.36
GR-I (Butyl)	.15½	.33
Wild Rubber		
Upriver Coarse (crude)	.12½	.26½
(washed and dried)	.20¼	.37¾
Islands Fine (crude)	.14½	.28¼
(washed and dried)	.22½	.40
Caucho Ball (crude)	.11½	.24¼
(washed and dried)	.19½	.37
Mangabiera (crude)	.08½	.19¾
(washed and dried)	.18	.35½

* For a complete list of all grades of all rubbers see Rubber Reserve Co. Circular 17, p. 169, May, 1943, issue.

Pittsburgh Plate Glass Co. stockholders at a special meeting August 29 authorized an increase in the common stock of the company from 2,600,000 shares of the par value of $25 to 12,500,000 shares of the par value of $10 each. President Harry B. Higgins explained that the action was a step in carrying out a proposal made by the directors last June to issue four shares of common stock of the par value of $10 each in lieu of each presently outstanding share of common stock of the par value of $25. The common stock is the only class of stock authorized or outstanding. In connection with the issuance of the company's common stock in the ratio of four to one, the directors will cause to be transferred from earned surplus to stated capital an aggregate amount equal to $15 for each presently outstanding share of the par value of $25. Mr. Higgins stated that the plan will not be carried out until about December 15, 1945, and requested stockholders not to forward their stock for exchange until notice is received.

W. I. Galliher, executive sales manager of Pittsburgh Plate Columbia Chemical Division, has announced the appointment of R. M. Simpson as sales representative for the Chicago territory, with headquarters in the Chicago office at 1721 Tribune Tower Bldg. He will represent the company on the sale of alkalies, liquid chlorine, and related industrial chemicals. He began with Pittsburgh Plate in September, 1944.

McCreary Tire & Rubber Co., Indiana, Pa., through Harry C. McCreary, president, announces that in an expanded program of sales to civilians it will continue its prewar policy of marketing passenger-car and truck tires through established recappers wherever possible. McCreary plans to extend operations to cover virtually all states east of the Mississippi River and in granting new franchises will give first consideration to dealers who have complete recapping equipment.

American Viscose Corp., 350 Fifth Ave., New York 1, N. Y., has completed plans for an expansion program that will increase its rayon production by approximately 100,000,000 pounds a year. The main part of the program comprises construction of a new plant at Radford, Va., which will produce approximately 55,000,000 pounds a year of viscose rayon staple, used chiefly in spun rayon fabrics. The balance of the increased output will result from enlarging the acetate rayon plant at Meadville, Pa., and the viscose rayon staple plant at Nitro, W. Va. Total annual current production of the company's seven plants is at the rate of approximately 260,000,000 pounds.

American Viscose, through President Wm. C. Appleton, explained that the use of rayon cord in the manufacture of heavy-duty tires resulted in the saving of 87 million pounds of rubber during the war, which made possible the production of one million extra passenger-car tires and two million heavy truck tires. The reason for these savings in rubber is to be found in the fact that rayon cords are thinner than cotton cords of equal strength; therefore less rubber is needed to encase the cords. The saving amounts to 450 pounds of rubber for each thousand pounds of rayon used. Consumption of high-tenacity rayon for tires reached an all-time high of 72 million pounds in 1944, a threefold increase over consumption in the year 1942.

OHIO

Sales Department Reorganized

Reorganization of the sales department of The General Tire & Rubber Co., Akron, with a view toward expansion of distribution, was announced last month by L. A. McQueen, vice president. Six departments, all operating directly under Mr. McQueen, have been set up under the new plan: K. A. Dalsky will manage truck tire sales; J. E. Powers, automobile tire sales; J. C. Ink heads a new department, sales operations; E. C. Leach is manager of Kraft recapping and tire accessory sales; S. S. Berry, of the battery and special item sales department, and R. H. Harrington heads the advertising and sales promotion department.

Under Mr. Dalsky's direction will be truck tires and tubes, industrial tires, tubes and wheels, airplane tires, tubes and wheels, mileage sales, manufacturers' sales, national account sales and government sales. Mr. Powers' responsibilities will be passenger-car tires and tubes, new dealer sales, changeover sales, jobber sales, GTAC sales, dealer relations, and sales training. The new sales operations department will handle price lists, expense control, auto purchase control, statistics and analysis, operating policies, display merchandising, and industry and governmental relations. In Mr. Leach's department will be supervision of camelback, repair materials, tire accessories, tire recapping and repairing equipment, tire shop tools and equipment, recapping and repairing. Mr. Harrington will be responsible for all advertising and all sales promotion. He announced the appointment of A. Ray Carr as a member of the advertising department beginning September 15. Mr. Carr is a graduate of Akron University, where he teaches night school classes in advertising and salesmanship.

Mr. Berry's department will look after battery sales and battery equipment, fans, and miscellaneous items.

Mr. McQueen also announced the appointment of J. A. Beckett to operate field service and engineering, a new department. Dan Collins has been brought in from the Denver branch to become manager of dealer relations.

O. W. Tucker has joined the sales organization of General Tire. Working out of the Memphis district office, he will headquarter in Nashville, Tenn. After graduating from college, Mr. Tucker spent eight years in the trucking business. In 1935 he became affiliated with a large rubber manufacturer in a sales capacity, where he remained until 1942. Soon after the outbreak of the war, Mr. Tucker became associated with the OPA in Louisville as a tire inspector for the State of Kentucky.

The General Tire & Rubber Co., Akron, as part of its postwar expansion plans on the eastern seaboard, has appointed George E. Walker to conduct sales schools in the principal cities of the east. As General Tire is planning to provide opportunities for returning servicemen, both in the sales organization and as tire distributers, it feels it is not enough just to provide veterans with jobs, but it should go farther and start them on their way with special training. Mr. Walker is well qualified, as he has spent 18 years in the tire business, and during his period of service in the Navy was engaged in the Navy's training program. A native of Charlottesville, Va., Mr. Walker was educated at the Naval Academy at Annapolis, graduating in 1923. After service on the *U.S.S. Utah*, he resigned and entered the automotive business in Charlottesville, where he was General Tire distributer from 1924 to 1942. At that time he was recalled to active duty and assigned to the navy's training program. He was discharged as a lieutenant commander.

General Tire in a further expansion in the Southwest, looking toward a greatly increased postwar market, has appointed two special representatives in the Houston branch, which is under the management of Harry L. Whitesell. Jack L. McCollum will be headquartered in San Antonio; he had been with The General Tire Acceptance Corp. before entering the army. Joe L. Young, Jr., will make his home in Beaumont, Tex., and will cover eastern Texas and western Louisiana. He comes to General Tire after wide experience with the Illinois Powder Co., working in the same territory he takes over for General.

Establishing a new policy of dividend payments, General Tire has voted to pay common stock dividends quarterly instead of semi-annually whenever earnings of the company and declaration by the board of directors permit. Dividend dates have been tentatively established as the last days of February, May, August, and November. The company's fiscal year ends November 30.

Ludwig with Adamson United

Adamson United Co., Akron, according to Andrew Hale, vice president in charge of engineering and sales, has appointed as chief engineer Carl Ludwig, for the last four years manager of construction and development with Hydropress, Inc., New York, N. Y. A graduate of Case School of Applied Science (Class of 1929), Mr. Ludwig first served as chief engineer of Hazelett Metals, Inc., where he engineered and designed special mills for continuous casting of metals. Then he went to Western Cartridge Co. as chief rolling mill engineer of its New Haven Winchester Repeating Arms division. Mr. Ludwig also contributed to the design of the Loewy press, extensively used during the war for high-speed cold extrusion of non-ferrous metals.



Fennar "Studio of Greenwich"

Carl Ludwig

New Long-Life Tire

Goodyear Tire & Rubber Co., Akron, has developed a new long-life tire built with rayon cord instead of cotton and said to be capable of greatly increased mileage, rolling so much more freely that gasoline savings result, and making possible a set of tires that will eventually last longer than the usual period of a car's ownership, by an individual. This new tire is considered to be to date the most important development since Goodyear developed the cord tire 32 years ago. Quantity production of rayon cord tires for passenger cars, however, is temporarily held up by two factors which should be eliminated shortly: government restriction limiting rayon cord use to truck and heavy-duty tires and the present inability of the rayon industry to supply the fabrics in the quantities needed due to a lack of production capacity.

Vehicles for oil exploration in Central America and southern United States are being equipped with giant tires four feet taller than the height of an average man. These Goodyear tires are ten feet in diameter and will be used for a new marsh buggy of the Gulf Research & Development Co. in Nicaragua. In 1936, Goodyear made similar tires for the original Gulf marsh buggy. The tires measure 120 inches in height and are 66 inches in diameter. Each weighs 315 pounds. The inner tube weighs 125 pounds. The Goodyear manufactured wheels on which the tires are mounted are hollow airtight aluminum drums which provide added buoyancy. A recently made Goodyear experimental airplane tire is 110 inches in diameter, and the load capacity and weight are much larger than the marsh buggy tire, but the diameter is 10 inches less. The marsh buggy tires are made without the non-skid tread design, but triangular shaped rubber segments are strung on steel cables and mounted transversely on the surface of the tire. The tires can be inflated, while the buggy is in operation, through power provided by the vehicle engine and made useful by means of a blower. Three to four pounds of pressure is normal inflation.

Pliobond, the Goodyear synthetic adhesive, is being employed by the Army in a new type of land mine said to escape detection by the enemy. Entirely non-metallic, the mines are constructed with porcelain or glass parts sealed to a flexible synthetic rubber bellows to make them watertight. The mines are detonated by any pressure exerted on top of the mine which compresses the bellows, thereby exploding the mine.

Pliobond, composed of a phenolic resin and synthetic rubber, provides a watertight and flexible bond from —70° to 140° F. Drying to a tacky condition within five minutes for a cold bond, it can be applied by brushing, spreading, roll coating, or spraying. Room temperature will dry it in 12 hours, although another factor entering into this is the porosity of the bond materials.

Transferred Abroad

Scott MacDonald has been transferred to the Wolverhampton, England, plant as division superintendent in charge of preparatory departments, and Lowell Bennett as chief chemist. Both men have long service with Goodyear. The former recently was in technical service 3½ years, and the latter has been manager of synthetic compounding since April, 1943.

Marshall F. Gillespie, manager squadrons since June, 1943, has been made Division A

superintendent at Wolverhampton; and his successor in squadrons is Edward W. Hamlin, pilot and personnel manager at Wingfoot Lake.

Frank R. Vernotzy goes to the plant in Argentina as personnel manager. Since 1943 he had been personnel manager of Goodyear's Lincoln, Neb., plant.

Also returning to the Philippines is Walter E. Thomas, Jr., assistant treasurer of the Philippines Rubber Projects, with offices in Manila. In addition to his Goodyear duties, Mr. Thomas will work in conjunction with the Rubber Development Corp. Mr. Thomas was formerly secretary of the Goodyear Orient Sales Co. and with others was evacuated from Singapore to Java when the Japanese came. While in Java, he enlisted with the U. S. Army in February, 1942, and held the rank of lieutenant colonel when he recently received his discharge.

Status of the Goodyear-Java tire factory, in Japanese hands since February, 1942, will be determined as a result of a forthcoming inspection trip by Louis D. Hochberg, the prewar plant superintendent, who has been superintendent of the Goodyear plant at New Bedford, Mass., since May, 1944. He left last month for Java accompanied by A. G. Buckley, chief engineer at Goodyear-Brazil, and they will make a thorough survey of Javanese holdings, after which they will return to Akron to report their findings.

Meanwhile A. L. Rodgers, division foreman of rubberized fabrics (balloon room and boats) has gone to New Bedford as acting superintendent. During his absence H. T. Evans will act as division foreman.

Formerly a textile mill, the New Bedford plant manufactured fuel cells during the war, but is now being reconverted for the production of bicycle tires and tubes, and life vests for the Navy. Personnel manager there is C. Blythe, formerly manager of Akron Plant 2 efficiency, who succeeded D. Miller, returned to Akron in charge of personnel efficiency.

Anchor Rubber Products, Inc., Cleveland, is tripling its capacity, now already double the prewar rate. The company, which manufactures rubber replacement parts for the automotive industry, has an annual sales volume of $1,500,000, compared with a prewar average of $400,000. President Oscar Kravetz feels that after the firm expands, the sales volume should average about $4,000,000 a year. Anchor Rubber at present has enough orders booked to keep it busy for more than two years. Employment will be increased from 100 to 300 men. The company will spend about $300,000 on its expansion program, including about $100,000 for new machinery, and the balance for plant facilities, preferably a nearby surplus government plant.

Mohawk Rubber Co., Akron, through President R. E. Bloch reports that sales for the first seven months of this year were 20% higher than in the like period last year.

The Surety Rubber Co., Carrollton, recently purchased the Martins Ferry Glove Co., Urichsville, which is now producing gloves for Surety's coated-fabric glove line, and a few numbers of regular cotton work gloves, especially hot mill gloves which have been a specialty of the company for years. The plant is being managed by Herbert Schneider.

Synthetic Tire to Outlast Natural Rubber Product

The B. F. Goodrich Co., Akron, at a reception in the Waldorf-Astoria Hotel in New York, N. Y., October 1, announced a new all-synthetic rubber tire which, it is said, will outlast prewar tires of natural rubber.

In his opening remarks, John L. Collyer, president of the Goodrich company, reminded his audience that five years ago last June, Goodrich had also set aside an afternoon for the express purpose of publicly introducing a new automobile tire—the "Ameripol" tire, a passenger-car tire made with more than 50% synthetic rubber. The introduction of this tire on June 5, 1940, "was the one and the best way" of focusing attention on the nation's precarious rubber situation, he stated. The point of unveiling the all-synthetic tire five weeks after the end of the war, Mr. Collyer said, was to call attention to the progress it represents "in improving and in working with man-made rubber which automatically gives American synthetic rubber increased stature in the world rubber picture."

A. W. Phillips, general superintendent of the Goodrich tire division, explained the technical aspects of the new tire. He emphasized that on the basis of extensive tests, it will outwear prewar tires of natural rubber, but said that this does *not* mean that synthetic rubber has become, in itself, the all-around equal or the superior of natural rubber.

The chief reason for the high performance of this new tire is the strength and durability made possible through important construction changes, such as wider tread, new and stronger cotton cord, and an increased number of cords per inch in the plies. Another reason is the use of an improved variation of the standard government rubber formula to achieve better wear, cooler running, and greater resistance to cracking and carcass bruising. This variation is a type of synthetic rubber called GR-S-10, in which rosin-base soap replaces fatty-acid soap as emulsifying agent for the latex, Mr. Phillips explained.

Personnel Changes

William E. Hatcher has been named general sales manager of Industria Colombiana De Llantas, S. A. Colombia, according to Antonio Puerto, president. The Colombian plant, located in Bogata, is an associate of the Goodrich company and makes tires and tubes under its supervision and laboratory control. Mr. Hatcher, who has spent nearly 20 years in the Central and South American export field, has been with Goodrich for 10 years as its field representative in Colombia, Venezuela, and Panama.

H. E. Heilman has been made operations manager for the Goodrich international division. A graduate of Peirce School of Business Administration, Philadelphia, Mr. Heilman has been with Goodrich since 1926 and in the international division seven years. In February, 1938, he rejoined the domestic company as a traveling auditor and in January, 1939, became district operating manager of the Cleveland district of the replacement tire division. He returned to Akron in June, 1942, as district operating manager of Akron tire district operating, where he is now succeeded by E. J. O'Donnell, formerly district operating manager of the Denver district.

Howard F. Miller has been named manager of the petroleum company tire sales department, succeeding William Sewall, assigned to special duties. Mr. Miller's most recent assignment was manager of fleet truck and bus tire sales. He has been with Goodrich since 1928 and has held a number of important sales posts.

Several changes have been made in the organization of the industrial products sales division. J. M. Failey has been named New York assistant district manager; R. G. Cox, manager of lathe cut, molded and extruded goods sales; George J. Fischer, manager of the hose department; and Edgar T. Gregory, operating manager.

The Industrial Oven Engineering Co., Cleveland, has opened a branch office at 332 S. Michigan Ave., Chicago, Ill., in the charge of H. W. Munday and F. T. Greaves, both graduate engineers and specialists in industrial heating problems. Mr. Munday is also a director of the Armour Research Foundation and a trustee of the Illinois Institute of Technology. Industrial Oven designs and manufactures all types of ovens and even processing systems for temperatures up to 1000° F., specializing in complete coating and impregnating systems for wire, cable, rope, tape, textiles, rubber, synthetics, etc.

The Timken Roller Bearing Co., Canton 6, has announced that L. H. Gegenheimer, after a four-year leave of absence for war duties in Washington, is back at Timken in his former capacity as sales engineer in the industrial division. His most recent assignment in Washington was chief of the Bearing Branch of the Tools Division, WPB, a post formerly held by Howard C. Sauer, another Timken employe, now head of the company's foreign division.

Hershberg Products Co., Inc., manufacturer and distributer of hard and soft rubber products, plastics, and fiber, Ashtabula, has elected P. S. Vormelker vice president in charge of chemical engineering. Previously he had been superintendent of Dunne Rubber Co., Ashtabula.

The Shellmar Products Co., Mt. Vernon, O., has purchased Rohm & Haas Co.'s South Gate, Calif., plant, including real estate, building, and equipment. Shelmar will continue to operate the plant as a methacrylate (Plexiglas) fabricating unit until military orders are complete and the plant can be converted to the company's postwar plastic and packaging business. All of the Rohm & Haas fabricating orders on the West Coast will be transferred directly to Shellmar, which will provide permanent employment for a large number of the present personnel; however, Rohm & Haas officials announced that the employes transferred to South Gate from the East will be given an opportunity of returning to the parent company. The sale of the South Gate plant, Rohm & Haas officials stated, is in keeping with the firm's established policy of minimizing fabrication processes. Shellmar has other plants in Pasadena and Glendale, Calif.

Foreign Economic Administration, Washington 25, D. C., on September 10 issued *Current Export Bulletin No. 276* covering "Revision and Relaxation of Export Controls," now possible that the war is over. Basically the revisions center around two major actions: regrouping of countries and establishment of a "positive list" of commodities, those remaining under control and requiring a license to export.

MIDWEST

Rand Monsanto President

Vice President William McNear Rand on September 25 was elected president of Monsanto Chemical Co., St. Louis, Mo., succeeding Charles Belknap, who will continue as chairman of its its executive committee. Board Chairman Edgar M. Queeny said that Mr. Belknap agreed to extend his service beyond the normal retirement date as executive committee chairman and board member at the request of the directorate.

For the last eight years Mr. Rand has been a Monsanto vice president and since November, 1943, a member of the executive committee. A native of Watertown, Mass., where he was born 59 years ago, and a graduate of Harvard University, Mr. Rand entered the organization in 1921 through the Merrimac Chemical Co., Everett, Mass., serving successively as treasurer, sales vice president and treasurer, executive vice president, and president. Merrimac was acquired by Monsanto in 1929, liquidated as a separate corporation in 1937, and thereafter operated as Monsanto's Merrimac division. With this change, Mr. Rand was made general manager of the division and vice-president of Monsanto, continuing as such until his transfer to St. Louis.

The new Monsanto president is regional vice president, executive committee member and a director of the National Association of Manufatcurers, and from 1937 to 1939 was president of the Associated Industries of Massachusetts. He is an overseer of Harvard University, a member of the Corporation of Northeastern University, and a former president of the Phillips Exeter Alumni Association of New England. The corporations of which he is a director, in addition to Monsanto, include the Liberty Mutual Insurance Co., the John Hancock Insurance Co., the First National Bank of St. Louis, and the St. Louis Union Trust Co.

Monsanto appointed Arnold H. Smith, director of the foreign department, to succeed Herbert M. Hodges, who reached retirement age on October 1. Mr. Hodges, however, will remain with the company as overseas director until completion of a special mission to China, India, and South Africa, when he will retire to his native England.

Mr. Smith is succeeded as assistant director of the foreign department by Marshall E. Young, formerly general export manager, who will accompany Mr. Hodges on his mission to open Monsanto agencies and appoint representatives in the countries visited.

A graduate of Armour Institute of Technology, Mr. Smith in 1922 joined Monsanto's Rubber Service Laboratories in Akron, where he was born, and served successively as technical sales manager and assistant sales manager. Then from 1930 through 1940, Mr. Smith was stationed in London, first as manager of the rubber chemical department and later as director of Monsanto Chemicals, Ltd. In 1940 he returned to St. Louis as manager of petroleum chemical sales and in 1944 became assistant director of the foreign department.

Mr. Young, an alumnus of Washington University, was employed in Monsanto's service department 1934-35 and then was transferred to the export department. He became general export manager in June, 1944.



William M. Rand

H. J. Heffernan has been named assistant general manager of sales of the Merrimac division, Boston, Mass. He came to Monsanto as a salesman in 1926 and in 1929 became branch manager of the division's New York office. Mr. Heffernan succeeds the late Horace Burrough, III, and in turn is succeeded by W. E. Drown, his assistant in the New York office.

J. J. McCarthy has been promoted from the development department to the division sales department as manager of textile sales development. He has been with the company since shortly after his graduation from Massachusetts State College in 1921.

Also, three assistant sales managers have been advanced to the sales managerships of their respective departments in the Merrimac division: W. R. Minchin, heavy chemicals department; T. C. Jasdale, organic and phosphate division; and P. O. Huntington, alcohol department.

John E. Gurvin, plant engineer of elemental phosphorus operations at Monsanto, Tenn., has been made vice president of the Monsanto subsidiary, Merritt Engineering & Sales Co., Inc., manufacturer and designer of plywood machinery, Lockport, N. Y.

S. U. Shorey, has been named assistant manager, plasticizers and resins sales, and B. B. Langton, assistant manager, intermediates sales. Mr. Shorey entered Monsanto's service in 1936 and for the past five years was sales representative for phosphate and organic chemicals divisions' products at Everett, Mass. Mr. Langton started with the company at Everett in 1940 and since last November has been in charge of Monsanto's Washington office. Both will report to C. H. Sommer, manager of plasticizers and intermediate sales, St. Louis.

Gaston F. DuBois, vice president and member of the executive committee of Monsanto Chemical, holder of the Perkin Medal, and a prominent figure in the American chemical industry for 40 years, retired September 1, but will continue as a director and will also serve as a consultant to the company. Born in LeLocle, Switzerland, he began his long connection with Monsanto in 1904. From 1913 to 1920 he was production manager; in 1920 he became vice president and technical director; in 1930 vice president in charge of research and development, and in 1939 a member of the executive committee.

Postwar Expansion Projects

Monsanto has listed 151 construction and expansion projects involving an estimated $48,400,000 for consideration as a part of its postwar program. Francis J. Curtis, vice president in charge of long-range planning, reported the company had examined the market potential of its newly developed products, as well as that of its present line of chemicals and plastics, with the conclusion that such an expenditure could be justified if certain conditioning factors develop favorably, such as the general tax picture, the degree of government control to be exercised, the reasonableness of labor's demands, and labor's willingness to stand behind contractual obligations.

Aside from proposed construction and expansion expenditures of $48,400,000, Mr. Curtis pointed out, additional working capital will be required. He indicated the bulk of proposed capital investments would be made at existing domestic plant locations. Monsanto now has plants, with physical assets valued at about $68,000,000, in 16 American cities. Some of the projects contemplate new or expanded facilities for chemicals now being produced; others look toward production of entirely new chemicals, and still others concern themselves with such items as new pilot plants, power plants, cafeterias, warehouses, office structures, research laboratories, safety and health appliances, etc.

The company, Mr. Curtis said, has a large backlog of warborn products for postwar development, having introduced 92 new chemicals in 1944 alone.

The Meyercord Co., manufacturer of decalcomania, 5323 W. Lake St., Chicago 1, Ill., has converted 100% to civilian production, according to Leonard H. Knopf, president. Not only did no employe lose a single day's work during the reconversion process, but a backlog of orders will require that approximately 100 new skilled workers be added to the present staff of 481 as soon as they can be found, Mr. Knopf added. The 88 employes who left Meyercord to enter the Armed Services will be returned to their old jobs, or to better ones, with full seniority for the time they were in service. They have received regular monthly letters from the company and their fellow workers. The company's main offices and plants are located in Chicago, with branches in Mexico City.

Marbon Corp., 1926 W. Tenth Ave., Gary, Ind., has made D. M. Pratt sales manager. During his association with the company Mr. Pratt has been connected with the development of various crude rubber adhesives, synthetic resins, and rubber-to-metal adhesives, later devoting his time to customer technical service and sales.

Bjorksten Laboratories has leased 1,000 square feet of space at 13791 S. Ave. "O," Chicago, Ill., in addition to the quarters occupied at 185 N. Wabash Ave., where the organization will continue its main office. The expansion has been occasioned by new research assignments which have materialized since V-J Day. During the past year Bjorksten Laboratories has been engaged in work on rubber fillers, plastics, new types of anti-corrosives and metal machining chemicals, carbon removers, and organic synthetic compounds for special purposes.

Kenneth Sutherland has joined the staff of Bjorksten Laboratories. He had previously been with Turco Products, Inc.

NEW ENGLAND

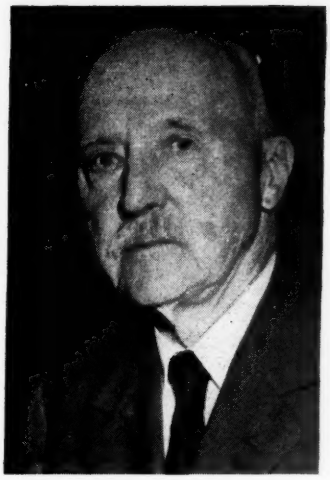
Windsor Mfg. Co., Windsor, Vt., is offering to the shoe trade Neolite, revolutionary sole product, in two new colors, natural and red. Originally produced in black and brown, Neolite in its new shades is recommended for sports shoes and high styled dress shoes for women. In addition to its immediate production in the two new colors, the company expects to make it available in any color or shade desired by the shoe manufacturer within a short time. Windsor officials announced also that Neolite soles in natural color for women's shoes would be available to shoe repair shops in October. Neolite for men's and children's shoes will appear a few weeks later. A completely new material for soles, neither leather, rubber, nor plastic, the Windsor product is said to be as light in weight as leather, is waterproof; gives longer wear and does not mark floors; nevertheless it gives a firm, comfortable platform for the foot.

Norwalk Tire & Rubber Co., Norwalk, Conn., has appointed W. Jerry Hawkins, Pacific Coast manager, with headquarters at 2464 Randolph St., Huntington Park, Calif. He had recently been assistant sales manager of Gilmore Oil Co., former distributer of Norwalk tires until its absorption by Mobilgas. Jack Whitehead, Norwalk president, recently returned from a trip to the Pacific Coast, taken to establish exclusive independent dealerships there as the company has decided to develop the West in line with the same policy used in the East—distributers covering comparatively small areas and having exclusive distribution of Norwalk tires in their trade areas.

Rheestone Thread Corp., manufacturer of rubber thread, Warren, R. I., which was organized December 19, 1944, under the laws of Rhode Island, reports that the plant is now in partial operation in purifying wild crude rubber, and full production of rubber thread will take place during the early part of 1946. About 150-200 workers will be employed. Officers of the company are: president, Daniel Rhee; vice president, Alfred B. Lingley; treasurer, Malcolm E. Stone; secretary, William C. Waring, Jr. These officers along with William P. Chapin comprise the directorate.

The Russell Mfg. Co., Middletown, Conn., is erecting a new research and testing laboratory, which will be equipped with the most modern apparatus for testing and product development. The one-story building, 61 by 123 feet, will be of cinder block and welded steel frame construction of sawtooth design and will have two large glass block windows on the front. The mechanical laboratory on the south end of the building will occupy a space approximately 40 by 60 feet, as will the chemical laboratory on the north end. Between the two laboratories will be conference room and offices.

The Sponge Rubber Products Co., Shelton, Conn., has appointed William F. Lang sales manager to succeed W. F. Newton, resigned. Mr. Lang, Washington representative since 1941 and in the Ohio territory before that, will make his headquarters in Shelton. The company, which manfactures cellular rubber products for all purposes, has a plant also in Derby, Conn.



Godfrey L. Cabot

Godfrey L. Cabot, 84-year-old head of Godfrey L. Cabot, Inc., 77 Franklin St., Boston, Mass., recently made his forty-fourth trip to Europe; it was his first by air, and his first crossing of the Atlantic in 1883 had been on a steamship equipped with sails. The veteran carbon black executive flew abroad to revive the International Air Federation of Paris, a world-wide organization of aeronautical clubs, which promotes international aeronautics and supervises the establishment of air records. Its last meeting took place in Paris in 1939. Mr. Cabot became a flier during World War I, when he was 56, and served as a Navy lieutenant who patroled the New England coast for German submarines. After that war he continued flying as a civilian and was elected president of the National Aeronautics Association.

Arthur D. Little, Inc., Cambridge, Mass., industrial research organization, has announced an addition to its staff: Howard F. MacMillan, formerly president and general manager of the Hydraulic Press Mfg. Co., Mt. Gilead, O., who will direct the application to industry of developments in the mechanical engineering and applied physics fields by the laboratories of Arthur D. Little, Inc. At present this work will concern particularly conversion to peacetime uses of important equipment and processes which had been developed during the war.

The Connecticut Hard Rubber Co., New Haven, Conn., in cooperation with the Dow Corning Corp., is producing commercially molded Silastic parts—gaskets, seals, hose, rubber to metal adhesion, and miscellaneous pieces. Extreme heat resistance is the outstanding physical characteristic of Silastic, trade name for the new Dow Corning silicone rubber, which withstands temperatures from minus 70° F. to plus 500° F. and still retains its original resilience and flexibility. Its excellent dielectric properties—arc, corona and oxidation resistance—are said to assure durability under hot service conditions. Silastic opens many new prospects for the designers of essential equipment, but such pieces must be carefully engineered and frequently reenforced with glass fabric. Connecticut Hard Rubber engineers are available for advice and consultation in exploring the possibilities opened by this new material.

PACIFIC COAST

Reconversion Slowed by Manpower Lack

Production of tires for southland passenger cars already has trebled since the heavy molds used for building military tires were replaced and the heavy block treads of combat tires gave way to the finer lines of civilian passenger treads, yet—

Reconversion of southern California's rubber industry, second only to Akron's, still is in low gear and cannot reach its immediate goal, a further 250% expansion, until more manpower is put on the newly converted production lines.

A WPB survey last month revealed that 13,000 passenger tires a day are rolling out of Los Angeles factories, as against a low of 3,500 last spring, when the industry's whole effort was concentrated on requirements of the Armed Forces. Blocking the way to the goal of 31,000 set by local plants is need of more men to operate the war-expanded facilities here.

Immediate jobs for 1,125 workers were indicated by the survey. In the United States Rubber Co. plant alone, 850 are needed for civilian tire and tube machinery besides the workers who manned the plant during the war period. Firestone Tire & Rubber officials said 200 men, skilled and unskilled, are needed as tire builders, curing room men, mechanics, and as trainees for various other jobs. At The B. F. Goodrich Co. plant it was declared that 75 more men "would get us up to full capacity." Goodyear Tire & Rubber also will need additional help as soon as more machinery can be installed.

All plants reported experiencing heavy losses of personnel since V-J Day. P. R. Levering, Goodrich personnel manager, said many people left to return to their eastern homes, and opening of schools also deprived the plant of any student employes. C. L. Smith, Firestone factory manager, cited the same difficulties in trying to maintain the round-the-clock operation necessary for efficient production in the rubber industry. He added that many patriotic women employes have quit, feeling that their war job was done.

Meanwhile new pressure from a tire-hungry public reportedly was reaching the industry.

"With gasoline rationing off, the civilian passenger demand has reached proportions beyond any estimate the industry reached before the war," John Miller, manager of the U. S. Rubber plant, declared. "The entire Los Angeles industry is aiming at hitting full stride with release of rationing as final objective.

"Thanks to increased production capacity, built on military necessity, we are now in a position to reach that objective in a comparatively short time if we can get needed workers," he added.

New postwar products already are beginning to blossom here, following revocation of most WPB restrictions on civilian rubber goods. The Goodyear plant expects within several weeks to resume production of safety inner tubes, banned during the war. Firestone is developing a new mechanical molded goods division to tap western markets for which the company had not previously produced here. Items ranging from automobile foot pedal

pads and floor mats to plungers and packing for oil-well pumps will be molded, and Firestone officials reported active demand for rubber tubing from reconverting plants who need it in products ranging from bicycle pumps to hose for launches and yachts. Toy manufacturers are seeking tires for scooters and coasters; while other plants have inquired regarding rubber tires for lawn mowers. U. S. Rubber expects new jobs to open up as result of a war-discovered use for synthetic rubber in covering propeller driveshafts in ships. Plant Manager Miller said every new Navy ship now is thus protected against corrosion and pitting from salt water and benefits by a greater cruising range. Southland tuna boat builders already have adopted this feature, and the rubber executive sees the West Coast shipbuilding industry as a new postwar market.

The Rubber Salvage Co., owned by Ben Feldman, has moved from 1500 17th St. to 383 Bayshore Blvd., San Francisco, Calif.

CANADA

Polymer Corp., Ltd., Sarnia, Ont., has appointed J. W. Holmes, Jr., manager of its sales and technical service division. Upon graduation from McGill University, Mr. Holmes handled technical sales of rubber chemicals, neoprene, and carbon black in Quebec and Ontario for several years for Canadian Industries, Ltd. He joined Polymer Corp. in 1942 as executive assistant to Managing Director J. R. Nicholson and shortly after assumed additional duties as executive assistant to President R. C. Berkinshaw. During 1943, Mr. Holmes worked for several months on the compounding and processing of Butyl rubber at the Esso Laboratories of Standard Oil Development Co., Elizabeth, N. J., and in visiting rubber companies in the U. S. A. Upon his return to Canada he was placed in charge of technical service on Butyl rubber for Polymer Corp. and in January, 1945, was made assistant technical service manager, which position he held until his recent appointment. The newly formed sales and technical service division will handle GR-S, GR-I, and other chemical products manufactured by the company. Mr. Holmes is also chairman of the Ontario Rubber Section of the Chemical Institute of Canada and is a member of the American Chemical Society.

Polymer Corp. on September 15 disclosed it will build a research laboratory and pilot plant at an estimated cost of $200,000. It is expected that both the laboratory section and the pilot plant proper would be ready for installation of equipment before the end of the year and that operations in the pilot plant would start in the spring. It will be operated by the Polymer research and development division headed by E. R. Rowzee. At first a pilot-plant staff of from 15 to 20 will be required, and it is intimated that this number may be increased to between 25 and 30. The design of both the pilot plant and the laboratory are such that they can be expanded without difficulty to accommodate new equipment and lines. The pilot plant will consist of a polymerization section for GR-S, containing complete facilities for small-scale reaction, coagulation, washing, and drying rubber. The basic action equipment will consist of several five-gallon reactors and an 80-gallon reactor. Also included will be a monomer preparation area designed primarily for production of small quantities of styrene-like monomers, but capable of being used for the small-scale production of any monomer. A laboratory section providing office space for pilot plant supervision, a laboratory to control operations in the pilot plant proper, and two special laboratories, for research purposes, will also be provided.

Seiberling Rubber Co. of Canada, Ltd., Toronto, Ont., according to President R. J. Thomas has about 70% of its productive facilities now on civilian output with the proportion to be increased steadily so that by the end of the year nearly all facilities should be operating to fill civilian needs. Mr. Thomas also said that Seiberling's new plant for the manufacture of synthetic tubes for passenger cars and trucks now is in operation and is expected to raise the company's tube output at least 50%.

Dominion Rubber Co., Ltd., Montreal, P. Q., on September 5 with fitting ceremonies broke ground for the new $1,000,000 addition to its Kitchener, Ont., tire plant. A. W. Hopton, vice president and general manager, told the gathering that this addition will include a four-story and basement building to cost $556,000, which will provide 100,000 square feet of floor space and be used principally as a warehouse. Besides a new steam plant and circulating system, with two boilers, will be installed at the tire plant at an approximate cost of $311,000. An additional outlay is to be made on a program of rehabilitation of existing plant facilities. Mr. Hopton further declared that not only will more tire and tube making equipment be installed, but new lines of production also are being planned, with a view to entering such markets as farm tractor and implement tires. Among those attending the ground breaking were Hon. Charles Daley, Ontario Minister of Labor; C. A. Ostling, director of engineers, and F. E. Worley, assistant director of engineers, United States Rubber Co., New York, N. Y.; F. G. Meunier, factory manager, Merchants Rubber Co., Kitchener; R. B. Marr, manager, Naugatuck Chemical Co., Ltd., Elmira, Ont.; and G. P. Davis, manager, Provincial Tire Co., Toronto.

OBITUARY

Thomas W. Miller

THOMAS W. MILLER, founder of the Faultless Rubber Co., Ashland, O., died of a heart attack on August 28 in his home in Ashland.

Mr. Miller was born in Summit County, O., February 12, 1875, and attended the public schools in Manchester and a business college in Akron. He began his career with the Akron Silver Plate Co., but in 1896, in partnership with several other business men he organized the Faultless Mfg. Co. in Akron. Then in 1900 it was reorganized as the Faultless Rubber Co. In 1903 Mr. Miller with H. B. Camp organized the Camp Rubber Co. in Ashland, and in 1904 Camp Rubber and Faultless Rubber merged. The deceased served as treasurer and general manager, then in 1907 he became president of the firm, which position he held until 1927 and was chairman of the board until he retired in 1941; however, he continued to serve on the board as a member until his death.

Mr. Miller was a member of the board of directors of The Rubber Manufacturers Association, Inc., the National City Bank in Cleveland, the First National Bank of Ashland, and F. E. Myers & Bro. Co. He also belonged to the Masons, Elks, and Trinity Luthern Church. He had long been active in Ashland's civic affairs.

Funeral services were held at his home in Ashland on August 31, and interment followed in Ashland Cemetery.

He is survived by his wife, two sons, a daughter, two grandchildren, two sisters, and a brother.

John P. Sheehan

JOHN P. SHEEHAN, veteran rubber man with the Fisk division of United States Rubber Co., New York, N. Y., died August 27 at his home in Chicopee, Mass. He was born in Springfield, Mass., on March 13, 1887. He was graduated from Holy Cross College in 1910.

Mr. Sheehan entered the rubber industry as a tire salesman with Fisk Rubber Co., Chicopee Falls, Mass., in 1911; since then he held various positions in the tire division.

Chairman of the Chicopee School Board and member of the elder council of the Knights of Columbus, Mr. Sheehan also has served as alumni president of his class.

Funeral services were held at his home August 30, followed by High Mass at St. Patrick's Church, Chicopee Falls, and interment in St. Patrick's Cemetery.

He leaves a wife, a son, and two daughters.

Robert Atkinson

ROBERT ATKINSON, Detroit district manager since 1927 of the steel and tube division of The Timken Roller Bearing Co., Canton, O., died August 26 at the age of 53 after a month's illness. He was born in Holly, Mich., and attended the University of Michigan, winning his Bachelor of Science degree in 1914 and the following year a Master of Science in chemical engineering.

He was a member of the First Presbyterian Church, Birmingham, Mich., the Holly 134 Lodge F. & A. M., the Detroit Scottish Rite Consistory and Moslem Shrine, and Detroit Golf, Detroit Athletic, Recess, and Economic clubs, and the Detroit Chapter of the American Society of Metals.

He leaves a wife and three daughters.

James D. Lynch

LIEUT. JAMES D. LYNCH, 25, on military leave as associate editor of publications at Monsanto Chemical Co., St. Louis, Mo., died of malnutrition in a Japanese prison camp on February 5, according to word received by the company on September 13. Lieutenant Lynch was taken prisoner with the fall of Bataan in April, 1942. He is survived by his mother.

E. L. Faber

EBERHARD LOTHAR FABER, 52, vice president of Eberhard Faber Pencil Co., Brooklyn, N. Y., treasurer of Eberhard Faber Rubber Co., Newark, N. J., and grandson of the founder, was drowned August 25, while attempting to rescue his son near their summer home in South Mantoloking, N. J.

Mr. Faber was born in New York in 1894 and was graduated from Princeton University in 1915.

Funeral services were held in Mantoloking on August 27; burial was the following day in Moravian Cemetery, Staten Island, N. Y.

Survivors include the widow, the son, and a daughter.

Harold H. Cummings

AFTER a long illness Harold Hammond Cummings, partner in the rubber brokerage firm of Wm. H. Cummings & Sons, 30 Church St., New York, N. Y., died on September 13 at his home in Montclair, N. J. Mr. Cummings, who was born in Jersey City, N. J., May 14, 1875, attended Bordentown Military Institute and the College of Physicians & Surgeons, Columbia University. Although an M.D. was conferred upon him, the deceased never practiced medicine, but joined the Cummings concern.

He belonged to the Masons, and the Upper Montclair Country, Commonwealth, and New York Columbia University clubs.

Funeral services were held on September 15 at his late residence. Burial was in Arlington Cemetery.

Surviving are two sons, a daughter, four grandchildren, and two brothers.

FINANCIAL

Hercules Powder Co., Wilmington, Del. First six months, 1945: net earnings, $2,898,767, equal, after preferred dividends, to $2 each on 1,316,710 common shares outstanding, compared with $2,182,174, or $1.46 a share, in the same period last year; provision for federal taxes, $8,695,907, against $5,645,463; reserve for contingencies, $200,000, against $200,000; net sales, $56,590,752, against $52,096,331.

National Lead Co., New York, N. Y., and wholly owned domestic subsidiaries. First six months: net profit, $3,475,845, equal to 79¢ a common share, against $2,881,028, or 60¢ a share, a year ago; sales, $90,006,931, against $80,450,640.

Pittsburgh Plate Glass Co., Pittsburgh, Pa. Six months ended June 30: consolidated net profit, $7,037,000, equal to $3.18 each on 2,211,306 capital shares, contrasted with $6,970,000, or $3.16 each on 2,208,723 shares, a year ago.

Raybestos-Manhattan, Inc., Passaic, N. J., and domestic subsidiaries. First six months: net profit, $666,422, equal to $1.06 a share, contrasted with $880,927, or $1.40 a share, in the same period last year; reserve for contingencies, $630,000, against $525,000.

New Jersey Zinc Co., New York, N. Y. First six months, 1945: net profit, $2,074,957, equal to $1.36 a share, against $2,705,897, or $1.38 a share, in the first half of 1944.

Phillips Petroleum Co., Bartlesville, Okla. First half: net profit, $14,578,404, equal to $2.96 each on the outstanding capital shares, compared with $9,004,538, or $1.83 a share, in the first half of 1944.

Socony-Vacuum Oil Co., Inc., New York, N. Y. June half: consolidated net income, $21,000,000, equal to 67¢ each on 31,178,323 outstanding shares, contrasted with $31,500,000, or $1.01 a capital share, in the first half last year.

Skelly Oil Co., Kansas City, Mo., and subsidiaries. First half: net income, $3,629,727, equivalent to $3.33 each on 981,348 common shares, compared with $3,403,365, or $3.45 a share, in the first six months of 1944; provision for taxes, $4,062,300, against $4,323,500.

United Carbon Co., Charleston, W. Va., and subsidiaries. First six months: net profit, $922,812, or $2.32 a share, against $984,595, or $2.47 a share, in the same period last year.

United States Rubber Co., New York, N. Y. First six months, 1945: net income, $7,121,720, equal, after preferred dividends, to $2.57 each on 1,759,092 common shares, contrasted with $5,852,827, or $1.85 a share, in the corresponding period last year; consolidated net sales, $268,447,897, 22% above the 1944 figure; provision for taxes and renegotiation of war contracts, $38,962,196, against $28,492,214; current assets on June 30, $173,745,574, including $26,974,825 cash, compared with $157,209,948, including $22,479,654 cash, December 31, 1944; current liabilities, $85,869,119, against $63,477,176.

St. Joseph Lead Co., New York, N. Y., and domestic subsidiaries. First six months: net income, $2,845,384, equal to $1.44 each on 1,975,465 shares, contrasted with $2,225,287, or $1.12 a share, in the 1944 period; net sales, $24,760,340, against $25,216,498.

S. S. White Dental Mfg. Co., Philadelphia, Pa., and subsidiaries. First half, 1945: net profit, $371,848, or $1.25 a share, against $554,568, or $1.19 a share, in the same months of 1944.

Federal Specifications Board

COMPOSED of representatives from ten government agencies, the Federal Specifications Board held its first meeting on September 11. The new agency was established in August by Clifton E. Mack, director of the Procurement Division of the Treasury Department, and supersedes the Federal Specifications Executive Committee. The new Board jointly with the standards staff of the Procurement Division is responsible for the specifications for the supplies used by the federal government. Federal specifications are used by government purchasing officers to describe their requirements to suppliers, and in using standard specifications large savings in favor of the government can be made.

In drafting federal specifications, which are approved and promulgated by the Director of Procurement, the Federal Specifications Board will supervise 74 technical committees, composed of scientific and expert personnel of the various government offices. The Board will also consider means to correlate specifications of the participating agencies with the federal specifications. In addition it plans to secure the cooperation of industrial and engineering societies, such as the American Standards Association, the American Society for Testing Materials, and many others.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
American Hard Rubber Co.	Com.	$0.25 q.	Sept. 29	Sept. 14
American Hard Rubber Co.	Pfd.	1.75 q.	Sept. 29	Sept. 14
American Wringer Co., Inc.	Com.	0.25	Oct. 1	Sept. 15
Armstrong Rubber Co.	"A" & "B"	0.15	Oct. 1	Sept. 18
Armstrong Rubber Co.	Pfd.	0.59⅜ q.	Oct. 1	Sept. 18
Crown Cork International	"A"	0.40 accum.	Oct. 1	Sept. 14
Crown Cork & Seal Co.	Com.	0.50 q.	Nov. 15	Oct. 15
Crown Cork & Seal, Ltd.	Com.	0.50 q.	Nov. 15	Oct. 15
Dewey & Almy Chemical Co.	Com.	0.35	Sept. 15	Aug. 31
Dewey & Almy Chemical Co.	"B"	0.35	Sept. 15	Aug. 31
Dewey & Almy Chemical Co.	Pfd.	1.06¼ q.	Oct. 20	Oct. 6
E. I. du Pont de Nemours & Co., Inc.	Com.	1.25	Sept. 14	Aug. 27
E. I. du Pont de Nemours & Co., Inc.	Pfd.	1.12½ q.	Oct. 25	Oct. 10
Endicott Johnson Corp.	4% Pfd.	1.00 q.	Oct. 1	Sept. 20
Endicott Johnson Corp.	Com.	0.75 q.	Oct. 1	Sept. 20
Faultless Rubber Co.	Com.	0.25	Oct. 1	Sept. 15
Firestone Tire & Rubber Co.	Com.	0.50	Oct. 20	Oct. 5
Garlock Packing Co.	Com.	0.50 q.	Sept. 29	Sept. 20
General Tire & Rubber Co.	Com.	0.25 q.	Sept. 25	Sept. 15
General Tire & Rubber Co.	Pfd.	1.06½ q.	Sept. 29	Sept. 9
B. F. Goodrich Co.	$5 Cum. Pfd.	1.25 q.	Sept. 29	Sept. 14
B. F. Goodrich Co.	Com.	0.50 q.	Sept. 18	Sept. 4
Goodyear Tire & Rubber Co. of Canada, Ltd.	Pfd.	0.62½ q.	Oct. 1	Sept. 15
Goodyear Tire & Rubber Co. of Canada, Ltd.	Com.	0.62 q.	Oct. 1	Sept. 15
Hercules Powder Co.	Com.	0.50	Sept. 25	Sept. 14
Jenkins Bros.	Com.	0.25	Sept. 28	Sept. 14
Jenkins Bros.	"E"	1.00 q.	Sept. 28	Sept. 14
Jenkins Bros.	7% Pfd.	1.75 q.	Sept. 28	Sept. 14
I. B. Kleinert Rubber Co.	Com.	0.25	Sept. 12	Sept. 1
Mansfield Tire & Rubber Co.	Com.	0.25 q.	Sept. 20	Sept. 10
Mansfield Tire & Rubber Co.	Pfd.	1.50 q.	Oct. 1	Sept. 24
Minnesota Mining & Mfg. Co.	Com.	0.35	Sept. 10	Aug. 31
Mohawk Rubber Co.	Com.	0.50 q.	Oct. 15	Sept. 25
Rome Cable Corp.	Com.	0.15 q.	Sept. 28	Sept. 12
Seiberling Rubber Co.	Com.	1.25 q.	Oct. 1	Sept. 15
Seiberling Rubber Co.	Pfd.	0.63 q.	Oct. 1	Sept. 15
A. G. Spalding & Bros., Inc.	Com.	0.40 res.	Oct. 15	Oct. 8
A. G. Spalding & Bros., Inc.	Pfd.	1.12½ q.	Oct. 30	Oct. 23
Thermoid Co.	Com.	0.15 q.	Sept. 15	Sept. 7
United Elastic Corp.	Com.	0.40 q.	Sept. 10	Aug. 18

Patents and Trade Marks

APPLICATION

United States

2,380,983. **Differential-Pressure Responsive Diaphragm Including a Sheet of Stiffener-Free Textile Completely Covered with a Cured Rubber-Like Material and Having a Permanent Annular Groove therein.** F. C. Mock, assignor to Bendix Product Corp., both of South Bend, Ind.

2,381,048. **Valved Compressible Bulb in an Applicator for Attachment to a Bottle.** A. Habostad, Fairbanks, Alaska.

2,381,061. **Flexible Plastic Sheet.** H. E. Kallmann, Boston, Mass.

2,381,068. **In an Ice-Cube Freezing Unit, a Main Tray and a Supplemental Tray Formed of an Elastic Material.** H. Lutes, Detroit, and J. J. Buzzell, Alpena, both in Mich.

2,381,163. **Insulating Material of Rubber and Mica.** C. G. Harford, Wollaston, Mass., assignor by mesne assignments, to Jefferson Electric Co., Bellwood, Ill.

2,381,245. **Molded Cell for Field Coils Consisting of a Channel-Shaped Member Made of Layers of Molded Sheets of Initially Flexible Impregnable Insulating Material, One or More Layers of Mica between the Layers of Impregnable Material, and an Impregnating Binder of a Hardenable Insulating Material.** J. S. Askey, Mount Lebanon, assignor to Westinghouse Electric Corp., East Pittsburgh, both in Pa.

2,381,249. **For Lining the Housing of a Bearing Assembly, Staves of Laminated Fibrous Material Impregnated with Heat-Hardening Resinoid.** A. J. Bastian, East Orange, N. J. assignor to Westinghouse Electric Corp., East Pittsburgh, Pa.

2,381,261. **A Holder for X-Ray Films Including a Curved Metallic Shoe, a Thin Lead Surface on its Convex Side, and a Removable Cassette Envelope of Pliable Elastic Rubber.** A. F. Cota, assignor to A. O. Smith Corp., both of Milwaukee, Wis.

2,381,378. **Friction Retarding Mechanism for Vehicle Suspension.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,381,381. **Deicer Shoe Including an Elongated, Thin Rubber Body.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,381,389. **Shoe.** M. P. Riesing, Pontiac, Mich., assignor to Firestone Tire & Rubber Co., Akron, O.

2,381,390. **Automobile Speed Warning Device Including an Accelerator Pedal with a Ball and Socket Joint Bearing of Rubber.** L. J. Vanke, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,381,391. **In a Bushing Assembly, an Outer Member Composed of an Oil-Resisting Synthetic Elastomer.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,381,393. **Wheel and Brake Assembly.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,381,394. **Mooring Buoy Including a Hollow Bulbous Body of Resilient Material.** H. P. Beach, Jr., Washington, D. C., assignor to Firestone Tire & Rubber Co., Akron, O.

2,381,399. **In a Vehicle Suspension, a Supported Torque Tube.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,381,400. **Fuel Tank.** F. W. Stavely, K. L. Edgar, and S. W. Hoffmann, assignors to Firestone Tire & Rubber Co., all of Akron, O.

2,381,402. **Droppable Fuel Tank.** F. A. Weber and H. H. Gregg, assignors to Firestone Tire & Rubber Co., all of Akron, O.

2,381,423. **In a Fuel Injector, a Body Having a Bore with Fuel Inlet, a Fuel Outlet, and a Reciprocable Valve, the Stem of Which Is Disposed in the Bore, and an Axially Elastic Sleeve Interposed between and Surface Bonded to Bore and Stem.** F. Buck, Lisle, Ill., assignor to International Harvester Co., a corporation of N. J.

2,381,426. **In a Flexible Joint for the Exhaust Line of an Internal Combustion Engine, Annular Packing Members of Resilient Material.** L. B. Allen, San Diego, and W. C. Heath, La Mesa, assignors to Solar Aircraft Co., San Diego, both in Calif.

2,381,488. **Rotary Spindle Drive Including in Combination a Spindle Bracket and Spindle, a Drive Motor Having a Drive Shaft Parallel to the Spindle and Having a Base Plate, and Rubber Cushioning Devices Connecting Base Plate and Spindle Bracket.** W. Coulson, assignor to Ex-Cell-O Corp., both of Detroit, Mich.

2,381,554. **Compression Fitting.** C. A. Norgren, Denver, Colo.

2,381,568. **Gas Mask.** L. Y. Booharin, assignor of one-half to M. Cooney, both of San Francisco, Calif.

2,381,603. **Car Coupling Equipment Including Resilient Cushioning Means of Non-Metallic Material.** E. A. Larsson, assignor to Ohio Brass Co., both of Mansfield, O.

2,381,650. **Fluid Pump for Drilling Machines.** J. A. Dick, Greenock, Pa.

2,381,663. **Display Head Including a Head Shell and a Hair-Simulating Portion Composed of a Base of Resilient Material Supported by the Shell.** L. L. Greneker, New York, N. Y.

2,381,739. **Hydrocarbon Liquid Container with a Wall of Layers of Synthetic Plastic Rubber-Like Materials, Bonded together, and an Intermediate Membrane Consisting of a Plastic Material Formed from a Synthetic Linear Polyamide.** R. B. Gray, Dundalk, assignor to Glenn F. Martin Co., Middle River, both in Md.

2,382,070. **Fountain Pen with Ink Sack.** E. E. Kratz, Kansas City, Mo.

2,382,141. **Pad for Laundry and Like Presses, Including Layers of Open-Mesh Woven Asbestos Yarns Impregnated with a Synthetic Resin.** E. L. Dawson and H. Taylor, assignors to Turner Bros. Asbestos Co., Ltd., all of Spotland, Rochdale, England.

2,382,246. **Rubber Insulators for a Vehicle Frame.** F. R. McFarland, Huntington Woods, assignor to Packard Motor Car Co., Detroit, both in Mich.

2,382,248. **Soling Material of Shredded Leather and Rubber.** C. D. Mason, assignor to Mishawaka Rubber & Woolen Mfg. Co., both of Mishawaka, Ind.

2,382,275. **In an Insulated Electric Cable, an Inner Layer Mainly of Rubber Hydrochloride, and over the First Layer, a Cover Mainly of Chlorinated Rubber.** O. A. J. van Lin, Venlo, and J. Hoekstra, Eindhoven, both in the Netherlands; vested in the Alien Property Custodian.

2,382,276. **Urinal of Flexible Material.** M. Wells, Los Angeles, Calif.

2,382,355. **Tow Rope for Excavations, With a Coating of a Tough, Flexible, Elastic, and at Least Translucent Plastic over a Coating Including Luminous Material.** R. F. Warren, Jr., Stratford, Conn.

2,382,364. **Facepiece.** W. P. Yant, Murraysville, assignor by direct and mesne assignments of one-half to Mine Safety Appliances Co., Pittsburgh, both in Pa., and one-half to R. Fink, Dayton, O.

2,382,372. **In a Resilient Mounting Having Members for Connection between a Load and a Support, a Sandwich Unit Having Opposed Plates Connected by a Resilient Element Such as Rubber.** L. Wallerstein, Jr., assignor to Lord Mfg. Co., both of Erie, Pa.

2,382,405. **Rubber Suction Cup for Separating Sheets from a Stack.** P. E. Eckman, Seattle, Wash., assignor to American Can Co., New York, N. Y.

2,382,468. **In a Device for Air Conducting Trunks of Forced Ventilation Systems, etc., a Resilient Annular Gasket.** F. A. Cull, Beaumont, Tex.

2,382,570. **Frictional Clutching Device.** H. T. Kraft, assignor to General Tire & Rubber Co., both of Akron, O.

2,382,706. **Sealing Arrangement for Steam Turbines Including a Disk With a Sealing Surface.** E. Gente, Berlin-Siemensstadt, Germany; vested in the Alien Property Custodian.

2,382,797-2,382,798. **In a Bilge Pump, a Housing Enclosing a Chamber and a Diaphragm of Flexible Elastic Material Extending across the Chamber.** T. Langan, Annapolis, Md.

2,382,857. **Magnetic Core for Electromagnetic Induction Apparatus Including in Combination Rings of Magnetic Material Arranged Side by Side so as to Form a Hollow Reentrant Magnetic Flux Path and a Hardened Plastic Non-Magnetic Insulating Material Completely filling the Spaces inside and between the Rings.** G. Camilli, Pittsfield, Mass., assignor to General Electric Co., a corporation of N. Y.

Dominion of Canada

429,208-429,209. **For a Shaft in a Bearing, a Cylindrical Rubber Journal Body Adapted to Discharge Lubricating Water.** E. S. Aker, Belleville, N. J., U. S. A.

429,224. **Cushion Tire.** H. C. Lord, Erie, Pa., U. S. A.

429,233. **Parachute Container Including a Hollow Cylindrical Body With a Tail and a Nose Secured to Opposite Ends, and Mounted in the Nose, a Cushioning Block of Aerated Rubber Material.** J. R. C. Quilter, Woking, Surrey, England.

429,237. **Metatarsal Support with a Resilient Pad of Rubber.** W. M. Scholl, Chicago, Ill., U. S. A.

429,290. **Readily Deformable Seat Cushion Having a Readily Deformable Resilient Plastic Fabric Covering Woven from Yarns, Strands, or Strips of Extruded, Oriented Polyvinyl Material.** Firestone Tire & Rubber Co., Akron, O., assignee of T. W. Stedman, New York, N. Y., U. S. A.

429,293. **In a Fluid Shock Absorber, the Combination of a Cylinder, a Piston with an Annular Groove, and in the Latter, a Resilient Annular Member of Normally Round Cross-Section.** Gabriel Co., Cleveland, assignee of E. L. Beecher, Cleveland Heights, both in O, U. S. A.

429,336. **Universal Joint Including Crossed Links, an Independent Housing, Receiving the Links, and Rubber Blocks between said Housing and said Links.** Thompson Products, Inc., Cleveland, O., assignee of A. Venditty, Detroit, Mich., both in the U. S. A.

429,356. **Clinical Irrigating Device.** C. B. Ferrel, San Francisco, Calif., U. S. A.

429,379. **Rubber-Like Pad in a Resilient Support for the Actuating Means of Friction Shoes in a Brake Arrangement for a Railway Car.** American Steel Foundries, assignee of C. E. Tack, both of Chicago, Ill., U. S. A.

429,481. **In a Tubular Fluid Conducting Swivel Coupling, an Outer Section, Having a Socket, an Inner Section Entering the Socket, and Sealing the Two Sections a Sealing Ring of Resilient Material with Spaced Annular Lips.** D. M. Philipps, Fullerton, Calif., U. S. A.

429,496. **Resilient Seat of Sponge Rubber, for Furniture.** A. T. Reynolds and W. F. Tode, both of New York, N. Y., U. S. A.

429,502. **A Free-Wheeling Clutch Including Relatively Rotable Coaxial Clutch Members and a Drive-Establishing Strip of Resiliently Compressible Material.** J. M. Dodwell, Shawbridge, P. Q.

429,510. **For Association with a Shaft and a Surrounding Member, a Seal Including a Member of Rubber or Like Material.** N. S. Reynolds, St. Louis, Mo., U. S. A.

429,577. **In a Friction Device, the Combination of Disk-Like Elements Including a Friction Element and an Elastic Band under Tension Extending Circumferentially about All the Disk-Like Elements.** Firestone Tire & Rubber Co., assignee of R. W. Brown, both of Akron, O., U. S. A.

429,588. **Liquid Fuel Container Consisting of a Fuel-Retaining Layer of Rubber-Like Material Substantially Resistant to the Fuel, a Film Containing Film-Forming Colloidal Material on the Outside of the Rubber Layer, and over All a Protective Covering Including a Resiliently Yieldable Material and an External Supporting Layer.** Imperial Chemical Industries, Ltd., London, assignee of A. Duerden, Stockport, both in England.

429,589. **Maternity Foundation Garment with a Resilient Panel.** Lewel Mfg. Co., Inc., Newark, assignee of S. L. Welsch, South Orange, both in N. J., U. S. A.

United Kingdom

575,050. **Seat or Cushion.** Dunlop Rubber Co., Ltd.

570,052. **Stop Nut.** Wingfoot Corp.

570,175. **Adhesives.** Wingfoot Corp.

570,185. **Flexible Packing or Gasket Material.** R. B. Kingman.

570,226. **Electrically Insulated Conductors.** E. I. du Pont de Nemours & Co., Inc.

570,349. **Coaxial Electric Cable.** Communications Patents, Ltd., and R. V. Roscoe.

570,603. **Cushion Tires.** H. C. Lord.

570,919. **Pneumatic Tires.** United States Rubber Co.

PROCESS

United States

2,381,074. **Inflatable Hose of Rubberized Fabric.** J. A. Muller, Ridgewood and L. Cranston, Glen Rock, both in N. J., assignors to United States Rubber Co., New York, N. Y.

2,381,083. **Cartridge Cases from Thermoplastic Material.** J. S. Shufflebotham, Walsall, England, assignor to Imperial Chemical Industries, Ltd., a corporation of Great Britain.

2,381,142. **Dental Floss from Synthetic Fibers of an Unplasticized Vinyl Resin.** A. A. Stonehill, Brooklyn, N. Y., assignor to Johnson & Johnson, New Brunswick, N. J.

2,381,383. **Inner Tubes with a Proofing Composition Evenly Distributed over Their Interiors.** G. E. Steinel, Barberton, assignor to Firestone Tire & Rubber Co., Akron, both in O.

2,381,495. **Abrasion-Resistant Surface on a Body of Plastic of Relatively Low Abrasion Resistance.** F. W. Hall, Brackenridge, assignor to Pittsburgh Plate Glass Co., Pittsburgh, both in Pa.

2,381,774. **Cork Substitute from Comminuted Leather, a Rubber Solvent, Rubber Cement, and a Wax-Like Material.** L. A. Riefenstahl, Wabach,

Ind., assignor to General Tire & Rubber Co., Akron, O.

2,382,068. **Pneumatic Tire with Tread Portion Including One or More Circumferentially Extending Ground-Engaging Ribs.** F. Kovacs, Akron, assignor to Seiberling Rubber Co., Barberton, both in O.

2,382,269. **Retreading Pneumatic Tires.** L. A. Stevens, Hudson, and I. W. Lederer, Lakewood, O.

2,382,568. **Molded Articles from Vegetable Material of the Species Eichhornia Crassipes.** A. Karim, Calcutta, British India.

2,382,569. Rubber Cushioning Unit. K. B. Kilborn, assignor to Wingfoot Corp., Akron, O.

2,382,742. **Non-Slippery Protective Coatings from Rubber Latex, Walnut Shells and Aluminous Cement.** H. K. Patch, Hermosa Beach, assignor to Crossfield Products Corp., Los Angeles, both in Calif.

2,382,806. **Indicia Bearing Plates and the Like of Synthetic Plastic Material.** J. F. Motson, Fox Chase Manor, Pa.

Dominion of Canada

429,447. **Covering with a Heat Vulcanized Material a Body Formed at Least in Part of a Polyvinyl Alcohol Composition Which Contains Water as a Plasticizer.** Resistoflex Corp., Belleville, assignee of E. S. Peierls, East Orange, and A. N. Troshkin, Nutley, all in N. J., U.S.A.

429,592. **Continuous Process for Making a Web of Thermoplastic Material Having Polished Surfaces.** Monsanto Chemical Co., St. Louis, Mo., assignee of B. P. Hazeltine, Chicopee Falls, and E. R. Derby, Springfield, both in Mass.

United Kingdom

570,073. **Curing Phenol-Formaldehyde Resins.** American Cyanamid Co.

570,108. **Electrical Components with Molded Plastic Coverings.** Igranic Electric Co., Ltd., and J. V. Wredden.

570,138. **Molding Articles of and Filling Cavaties with Rubber-Like Materials.** E. I. du Pont de Nemours & Co., Inc.

570,139. **Extrusion of Thermoplastic Materials.** Wingfoot Corp.

570,169. **Maintenance of Predetermined Conditions on the Surfaces or Resinous Members.** Westinghouse Electric International Co.

570,302. **Retreading Tires.** Union Rubber Works, Ltd., and J. A. W. Llewellen.

570,460. **Manufacturing, Repairing, and Retreading Pneumatic Tires.** H. Simon, Ltd., G. W. Calvert, and G. B. Lett.

570,620. **Hollow Rubber Articles.** Andre Rubber Co., Ltd., and J. Heaton.

570,667. **Cushion Heels.** United States Rubber Co.

570,808. **Rubber Threads.** United States Rubber Co.

570,840. **Compound Sheet Materials.** J. H. McGill and Imperial Chemical Industries, Ltd.

CHEMICAL

United States

2,380,905. **Polymerizing in Aqueous Emulsion a Butadiene-1,3 Hydrocarbon Material in the Presence of an Aliphatic Organic Compound Containing Less Than 12 Carbon Atoms and at Least One, but not More Than Two Divalent Sulphur Atoms.** W. D. Stewart, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,381,020. **Treating Vinyl Resin Textiles with a Composition of a Wetting Agent and a Water-Dispersible Polyethylene Imine, and Subsequently with an Aliphatic Aldehyde to Reduce the Tendency of the Textiles to Accumulate Charges of Static Electricity.** B. G. Wilkes, Wilkinsburg, Pa., and W. A. Denison, South Charleston, W. Va., assignors to Carbide & Carbon Chemicals Corp., New York, N. Y.

2,381,037. **Preparing Monochloro-1, 3-Butadienes from Butane.** A. S. Carter and F. W. Johnson, assignors to E. I. du Pont de Nemours & Co., Inc., all of Wilmington, Del.

2,381,038. **Continuous Production of Hydrogen Chloride and a Conjugated Diene.** A. S. Carter and A. V. Willett, Jr., assignors to E. I. du Pont de Nemours & Co., Inc., all of Wilmington, Del.

2,381,059. **Vulcanizing a Polymerizate of a Butadiene-1, 3-Hydrocarbon with a Compound Containing a Single Ethylenic Double Bond, by Heating in the Presence of Sulphur and a 2-Mercaptothiazoline, and in the Presence of a Member of the Class of Monocarboxylic Acids and Their Salts with Metals Capable of Forming Activating Oxides, and in the Absence of More Than the Stoichiometric Amount of Activating Metallic Oxides Needed to React with the Acidic Constituents of the Composition during Vulcanization.** P. C. Jones, Silver Lake Village, O., assignor to B. F. Goodrich Co., New York.

2,381,063. **Vulcanizing Polymerized Glycol Monoacrylate by Dispersing therein Octamethylene Diisocyanate.** F. E. Kung, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,381,121. **Condensation Products of Triazines and Substitute Triazines with Alkylene Oxides.** W. P. Ericks, Cos Cob, Conn., assignor to American Cyanamid Co., New York, N. Y.

2,381,180. **Cyclized Rubber Stabilized with the Condensation Product of an Aldehyde and a Polyalkylene Polyamine.** H. J. Osterhof, Cuyahoga Falls, assignor to Wingfoot Corp., Akron, O.

2,381,186. **As Bonding Agent in a Rubber-to-Metal Part, Cyclized Rubber Adhesive and a Minor Proportion of an Organic Diisocyanate.** G. F. Roquemore, assignor to Wingfoot Corp., both of Akron, O.

2,381,247. **Material from the Group of Film-Forming Resins and Cellulose Esters and Ethers Having as Plasticizer a Mixture of Pentaerythritol Diacetate Dipropionate and Dipentaerythritol Triacetate Tripopionate.** R. H. Barth, Ridgewood, and H. Burrell, Paramus, both in N. J., assignors by mesne assignments to Heyden Chemical Corp, New York, N. Y.

2,381,248. **Gasket Material Consisting of Butadiene-Acrylonitrile Copolymer, Wood Flour, a Plasticizer Soluble in Hydrocarbon Fluids, and a Material from the Group of Natural Rubber, and a Butadiene Styrene Copolymer.** R. C. Bascom, Port Clinton, O., assignor to Standard Products Co., Detroit, Mich.

2,381,266. **As Bond for an Abrasive Article, a Vulcanized Mixture of Rubber, Sulphur to Vulcanize the Rubber to Hard Rubber, and Polymerized Chloro-2-Butadiene-1, 3.** C. E. Drake, Bloomfield, N. J., assignor to United States Rubber Co., New York, N. Y.

2,381,267. **As Bond for an Abrasive Article, a Vulcanized Mixture of Synthetic Rubber, Sulphur to Vulcanize it to a State Comparable to Hard Rubber, and a Material from the Group of Polymerized Chloro-2-Butadiene-1, 3, Copolymers of Isobutylene and a Conjugated Diolefin, and Organic Polysulphide Polymer Plastics.** C. E. Drake, Bloomfield, N. J., assignor to United States Rubber Co., New York, N. Y.

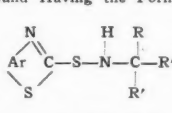
2,381,311. **Separating a Diolefin from a Hydrocarbon Mixture by Means of a Selective Extraction with a Solution Containing a Cuprous Salt Dissolved in a Pyridine Base.** R. F. Robey, Roselle, and M. W. Swaney, Linden, both in N. J., assignors to Jasco, Inc., a corporation of La.

2,381,338. **Copolymer of Trichlorethylene and Vinyl Trimethylacetate.** W. R. Cornthwaite, Niagara Falls, and N. D. Scott, Sanborn, both in N. Y., assignors to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,381,371. **Preparing Methyl—γ—Cyanopropyl Ketone by Reacting Acetone with Acrylonitrile in Equimolecular Proportions in the Presence of an Alkaline Condensing Agent at a Temperature between 0° to 100° C.** O. W. Shannon, Niagara Falls, N. Y., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,381,380. **Sponge Rubber from Latex.** M. Carter, Trenton, N. J., assignor to Firestone Tire & Rubber Co., Akron, O.

2,381,384. **Vulcanizing Rubber in the Presence of a Compound Having the Formula**



Where Ar Is an Orthoarylene Radical, R and R′ Are from the Group of Hydrogen, Alkyl Radicals, and Hydroxyalkyl Radicals, and R′′ Is an Hydroxyalkyl Radical. E. L. Carr, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,381,388. **Cement Including Butyl Formate and a Material Made by Interpolymerizing a Mixture Including Butadiene and Acrylonitrile.** W. E. Tann, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,381,392. **Vulcanizing Rubber in the Presence of a Thiocarbamyl Primary Amino Sulphide.** G. E. P. Smith, Jr., and E. L. Carr, assignors to Firestone Tire & Rubber Co., all of Akron, O.

2,381,397. **Vulcanizing Rubber in the Presence of a 2-Mercapto-Tetrahydrobenzothiazole.** G. E. P. Smith, Jr., assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,381,409. **Separating Isoprene from a Hydrocarbon Mixture Including Isoprene and Piperylene.** S. C. Stowe, assignor to Dow Chemical Co., both of Midland, Mich.

2,381,433. **Preparing Esters of Endoethylene Hydroxycyclopentanoindane by Reacting 1, 4-Endomethylene Tetrahydro—^{2}A—Fluorene in the Presence of an Acidic Condensing Agent with a Carboxylic Acid.** H. A. Bruson, assignor to Resinous Products & Chemical Co., both of Philadelphia, Pa.

2,381,470-2,381,472. **Improved Production of Amines and Nitriles.** J. W. Teter, Chicago, Ill., assignor to Sinclair Refining Co., New York, N. Y.

2,381,483. **Composition Including a Chlorobenzyl Ester of a Xanthic Acid.** E. S. Blake and K. L. Godfrey, both of Nitro, W. Va., assignors to Monsanto Chemical Co., St. Louis, Mo.

2,381,511. **Cellulose Ester Plasticized with an Ester of a Polyglycol and an Acid Half-Ester of a Saturated Monohydric Alcohol and Carbonic Acid.** I. E. Muskat, Akron, and F. Strain, Norton Center, both in O., assignors to Pittsburgh Plate Glass Co., Pittsburgh, Pa.

2,381,526. **Composition Including an Unvulcanized Polymer of a Butadiene-1, 3 Compound and the Condensation Product of a Ketone and a Primary Aliphatic Amine.** M. C. Throdahl, Nitro, W. Va., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,381,561. **Polymerizing a Vinyl Compound in the Liquid Phase and in the Presence of a Catalyst Consisting of a Peroxide of an Aldehyde Containing not Less Than Three and not More Than Four Carbon Atoms in the Molecule and Containing an Olefinic Double Bond.** H. P. Staudinger, Ewell, K. H. W. Tuerck, Banstead, and C. A. Brighton, Ewell both in England, assignors to Distillers Co., Ltd., Edinburgh, Scotland.

2,381,691-2,381,692. **Producing Butadiene from n-Butane.** W. A. Schulze and J. C. Hillyer, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., a corporation of Del.

2,381,693. **Preparing Pentadiene from n-Pentane.** W. A. Schulze and J. C. Hillyer, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., a corporation of Del.

2,381,694. **Transparent Regenerated Cellulose Wrapping Sheeting Carrying a Clear Unpigmented Film of Chlorinated Rubber Stabilized with a Light Metal Naphthenate.** P. H. Scrutchfield, assignor to Hercules Powder Co., both of Wilmington, Del.

2,381,701. **Producing a 1-Nitro-Propene by Condensation of Acetylene in the Liquid Phase with a Nitro-Paraffin.** H. P. Staudinger, Ewell, and K. H. W. Tuerck, Banstead, both in England, assignors to Distillers Co., Ltd., Edinburgh, Scotland.

2,381,702. **Addition of a Periodate to a Polymerizable Unsaturated Organic Compound Containing a Methylene Group Attached by an Olefinic Double Bond to a Carbon Atom in the Structure**



in Order to Initiate Polymerization. W. D. Stewart, Akron, O., assignor by mesne assignments to B. F. Goodrich Co., Akron, O.

2,381,706. **Manufacture of Sponge Rubber from Aqueous Rubber Dispersions Mixed with Fragments of a Gel in which the Gelling Agent is a Water-Insoluble Aluminum Pectate.** C. W. Wilson, Norco, assignor to California Fruit Growers Exchange, Los Angeles, both in Calif.

2,381,709. **Amines and Nitriles.** F. A. Apgar and J. W. Teter, Chicago, Ill., assignors to Sinclair Refining Co., New York, N. Y.

2,381,771. **As Antioxidant, a Para-Substituted Arylamino 2, 2, 4-Trialkyl Dihydroquinoline.** P. T. Paul, Naugatuck, Conn., assignor to United States Rubber Co., New York, N. Y.

2,381,865. **Depositing Rubber from Latex by Bringing the Latex into Contact with a Surface Coated with an Alkaline Water-Soluble Mixture of Substantially Equal Parts of Calcium Oxide, Calcium Nitrate, and Zinc Acetate.** G. T. Buchanan, Winnsboro, N. C.

2,381,880. **Coating Composition Containing a Polyhydric Alcohol Mixed Ester of a Mono-Carboxylic Acid.** M. E. Cupery, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,381,881. **Coating Composition Containing a Polyhydric Alcohol Mixed Ester of a β-Furylacrylic Acid and a Monofunctional Monocarboxylic Acid of Different Structure.** H. S. Rothrock, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,381,882. **Coating Composition Containing a Polyhydric Alcohol Mixed Ester of a Cyano Unsaturated Monocarboxylic Acid.** M. E. Cupery, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,381,883. **Coating Composition Containing a Polyhydric Alcohol Ester of a Cinnamalacetic Acid.** M. M. Brubaker, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,381,884. **Coating Composition Containing a β-furylacrylic Acid-Modified Alkyd Resin.** H. S. Rothrock, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,381,885. **A Polyhydric Alcohol Mixed Ester of an α, β—Ethylenic—α—(alken—1—yl) Monofunctional Monocarboxylic Acid and Another Monofunctional Monocarboxylic Acid.** J. C. Sauer, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,381,886. **Polyhydric Alcohol Ester of an Acylacrylic Acid.** M. E. Cupery, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,381,887. **Polyhydric Alcohol Mixed Ester of a Monofunctional α, β—Ethylene—β—Aryl Monocarboxylic Acid and Another Monofunctional Monocarboxylic Acid.** J. C. Sauer, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,381,888. **Preparing Polyhydric Alcohol Mixed Esters of Fatty Acids of Naturally Occurring Oils and α, β—Unsaturated Monofunctional Monocarboxylic Acids.** C. Le V. Agre, Minneapolis, Minn., assignor to E. I. du Pont & Co., Wilmington, Del.

2,381,889. **Polyhydric Alcohol Ester of a Thienylacrylic Acid.** M. M. Brubaker, Boothwyn, Pa., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,381,969. **Resinous Product Including the Co-Ester Reaction Product of an Acidic Natural Resin, a Cyclopentadiene Adduct of Maleic Anhydride and a Polyhydric Alcohol.** W. R. Callow, Jr., Bloomfield, N. J., assignor to Bakelite Corp., New York, N. Y.

2,382,036. **Process Which Includes Reacting Two Mols of Acrylonitrile with One Mol of Water in the Presence of an Alkaline Catalyst.** H. A. Bruson, assignor to Resinous Products & Chemical Co., both of Philadelphia, Pa.

2,382,037. **Norpolycyclopentadiene Monohydrohalides.** H. A. Bruson, assignor to Resinous Products & Chemical Co., both of Philadelphia, Pa.

2,382,184. **Resinous Material from a Petroleum Oil Fraction Containing Cyclic Hydrocarbons Reacted with an Aldehyde in the Presence of a Condensing Agent from the Group of BF_3 Etherate, BF_3 Alcoholate, $H_3BO_2F_2$ and $H_3BO_2F_2BF_3$.** K. M. Thompson, Aldan, Pa., assignor to Atlantic Refining Co., Philadelphia, Pa.

2,382,207. **Adding a Modicum of Organic Amide to Stabilize Furfural.** R. L. Comstock, and H. F. Reeves, Jr., both of Weeks, assignors to Bay Chemical Co., Inc., New Orleans, both in La.

2,382,211. **Reaction Products of Aldehydes and Diazine Derivatives.** G. F. D'Alelio and J. W. Underwood, Pittsfield, Mass., assignors to General Electric Co., a corporation of N. Y.

2,382,212-2,382,213. **Linoleum Composition Having as Binder a Copolymer of an Oxidized Drying Oil Free of Conjugated Double Bonds and a Vinyl Compound from the Group of Styrene and Acrylonitrile, and an Acid Catalyst for Polymerizing the Oil.** L. H. Dunlap, assignor to Armstrong Cork Co., both of Lancaster, Pa.

2,382,238. **Preparing Synthetic Plastics by Condensing an Aliphatic Polyamine Having a Primary Amine Group and an Aldehyde with a Phenol to the Point at Which the Condensation Product Is Still Soluble in Organic Solvents, and Mixing the Resulting Resin with a Nitrocellulose Varnish and Promptly Applying the Mixture to a Base to Be Coated.** W. Laufenberg, Berlin-Lankwitz, E. Maslanka, Birkenwerder, and H. Weissenburger, Berlin-Tempelhof, all in Germany, assignors by mesne assignments to Licoro Corp., New York, N. Y.

2,382,284. **Factis Produced by Reacting in Solvent Naphtha a Mixture of Levulinic Acid, Soy Bean Oil, and Sulphur, Leaving Part of the Solvent Naphtha in the Factis, and Removing the Excess Solvent Naphtha by Distillation.** I. Bencowitz, Newgulf, assignor to Texas Gulf Sulphur Co., Houston, both in Tex.

2,382,342. **Chlorinated Rubber.** E. B. Spaulding, Madison, Wis., assignor to Hercules Powder Co., Wilmington, Del.

2,382,353. **Chlorinated Rubber of a Viscosity above 15 Centipoises and below 28 Centipoises and of Improved Compatibility with Alkyd Resins.** H. L. Tomkinson, Sayreville, N. J., assignor to Hercules Powder Co., Wilmington, Del.

2,382,383. **Removing Acetylene Polymers from Crude Acrylonitrile.** E. L. Carpenter, Old Greenwich, Conn., assignor to American Cyanamid Co., New York, N. Y.

2,382,417. **Oil-in-Water-Type Dispersion in Which Individual Dispersed Particles Each Consist of an Intimate Blend of a Polyvalent Metal Soap and Rubber.** J. O. Hendricks, White Bear Lake, assignor to Minnesota Mining & Mfg. Co., St. Paul, both in Minn.

2,382,423. **In Manufacturing Insulated Conductors, Saturating a Fibrous Jacket with a Solution of a Partially Polymerized Nitrogen Halo Phosphide in Benzol, Evaporating the Solvent, and Further Polymerizing the Residue in the Fibrous Jacket.** H. J. Kauth, Rome, assignor to General Cable Corp., New York, both in N. Y.

2,382,443. **Composition for Lining Can Ends, Including a Solid Linear Polymer of Polybutene, Wood Flour, and Amorphous Wax.** J. E. Robinson, Glen Ellyn, and F. H. Bopp and P. W. Millelot, Jr., Maywood, both in Ill., assignors to American Can Co., New York, N. Y.

2,382,462. **Plastic Product from a Mixture of Scrap or Reclaimed Rubber, Technical Tolyl Dichlor Phosphine, and Retene.** D. J. Beaver, St. Albans, W. Va., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,382,473. **Recovering Substantially Pure Butadiene from a C_4 Hydrocarbon Fraction Containing It in Admixture with 1-Butene, 2-Butenes, and Normal Butane.** F. E. Frey, Bartlesville, Okla., assignor to Phillips Petroleum Co., a corporation of Del.

2,382,497. **Composition Obtained by Intimately Mixing a Rubber, with an Organic Phosphine Halide.** G. D. Martin, Nitro, W. Va., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,382,498. **Electrical Insulating Material Obtained by Swelling Rubber in Liquid Polymerizable Styrene, Mixing the Composition to Make it Homogeneous, Heating to Polymerize the Styrene, and Then Milling Polymerized Monoolefin into the Composition.** J. F. Morley, London, W.C.2, England, assignor to International Standard Electric Corp., New York, N. Y.

2,382,524. **Vulcanizing Rubber in the Presence of an Amine Salt of a 2-Mercapto 4-Aryl Thiodiazole 5-Thione in Which the Amine Is from the Group of Aliphatic Amines, Aromatic Substituted Aliphatic Amines, Alicyclic Amines, and Guanidines.** G. W. Watt, Austin, Tex., assignor to Wingfoot Corp., Akron, O.

2,382,529. **Chlorinated Rubber Coating Compositions Dissolved in Aromatic Hydrocarbon Solvents.** L. Auer, South Orange, N. J.

2,382,532. **A Stable Oil-in-Water Dispersion of a Vulcanized Fatty Oil Containing Methyl Cellulose and Another Surface Active Agent Which Reduces the Surface Tension of the Oil-Water Interface.** L. Auer, South Orange, N. J.

2,382,545. **A Resin Acid Lactone.** R. F. B. Cox, assignor to Hercules Powder Co., both of Wilmington, Del.

2,382,548. **Treating Acrylonitrile Concurrently with a Halogen and an Alcohol in an Acidic Medium to Produce Dihalopropionic Esters.** J. D. D'Ianni, assignor to Wingfoot Corp., both of Akron, O.

2,382,603. **Recovering Vinylacetylene in Concentrated Form from a C_4 Hydrocarbon Stream Containing It and Other Aliphatic C_4 Hydrocarbons.** C. K. Buell, Bunavista, Tex., assignor to Phillips Petroleum Co., a corporation of Del.

2,382,629. **Polymerizing a Mixture of a 1-Carboalkoxybutadiene-1, 3 and a Compound of the Formula**

$$CH_2=C(X)-Y$$

Where X Is of the Group of —H, —Cl, and $—CH_3$, and Y Is of the Group of —CN, —COOH, and —COOR, Where R Is a Hydrocarbon Radical. H. Gudgeon and R. Hill, Blackley, Manchester, England, assignors to Imperial Chemical Industries, Ltd., a corporation of Great Britain.

2,382,640. **Resinous Homopolymer of a 2-Aryl-4-Methylene-1,3-Dioxolane.** W. O. Kenyon and T. F. Murray, assignors to Eastman Kodak Co., all of Rochester, N. Y.

2,382,684. **Making a Plastic Synthetic Rubber-Like Material by Polymerizing in Aqueous Dispersion and in the Presence of a Diazonium Salt or Compound Capable of Forming Diazonium Salts under the Reaction Conditions, a Material Preponderantly a Compound of the Group of Polymerizable Acylic 1,3-Diene Hydrocarbons and Their Monohalogen Derivatives.** H. W. Walker, Woodstown, N. J., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,382,714. **Composition Including a Plastic Base Material from the Group of Cellulose Ethers, Cellulose Esters, and Resins, and as Plasticizing Agent for the Base Material, a Heterocyclic Compound Composed of a Single Heterocyclic Nucleus Having as Part of Its Nuclear Ring Structure at Least One —C(SR)=N— Group, in Which R Is a Hydrocarbon Radical.** W. Hentrich, Rodleben, W. Kaiser, Dessau, and R. Endres, Dessau-Rosslau, all in Anhalt, Germany; vested in the Alien Property Custodian.

2,382,731. **Adhesive Coating Composed of Triethylene Glycol Ester of Hydrogenated Rosin, Rubber, and Zinc Oxide.** J. G. Little, assignor to Hercules Powder Co., both of Wilmington, Del.

2,382,749. **Producing a Diolefin from a Heterocyclic Compound of the Furan Series.** H. M. Singleton, Goose Creek, Tex., assignor to Standard Oil Development Co., a corporation of Del.

2,382,764. **Poly-Glycerol Resin.** H. H. and C. S. Young and P. Bradford, assignors to Industrial Patents Corp., all of Chicago, Ill.

2,382,769. **Vulcanizing Rubber in the Presence of an Accelerator Which Is a Pyridazine Sulphide.** R. T. Armstrong, assignor to United States Rubber Co., both of New York, N. Y.

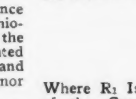
2,382,792. **Preparing a Plastic Conversion Product of Elastic Polychloroprene with the Aid of a Reaction Product of an Aliphatic Aldehyde and an Amine from the Group of Secondary Aliphatic, Secondary Aralkyl, Secondary Alicyclic, and Secondary Heterocyclic Amines.** L. H. Howland, Cheshire, Conn., assignor to United States Rubber Co., New York, N. Y.

2,382,793. **Preparing Sulphene Amides by Reacting a Thiazyl 2-Sulphene Amide Having an Unsubstituted Amide Group with an Amine Stronger than Ammonia and Having at Least One Replaceable Hydrogen Atom.** L. H. Howland, Waterbury, Conn., assignor to United States Rubber Co., New York, N. Y.

2,382,802. **Copolymerizing an Aqueous Emulsion Containing a Butadiene-1,3 Hydrocarbon and a Mono-Vinyl Compound with the Aid of a Polymerization Catalyst in the Presence of an Unsubstituted Naphthyl Mono-Mercaptan.** W. E. Messer, Cheshire, assignor to United States Rubber Co., New York, both in N. Y.

2,382,803. **Reaction Product of Equimolecular Proportions of Myrcene and Acrylonitrile.** A. A. Miller, Stamford, Conn., and T. F. Bradley, Edgewood, Md., assignors to American Cyanamid Co., New York, N. Y.

2,382,812. **Plastic Material Resembling Uncured Natural Rubber Obtained by Polymerizing a 1,3-Diene of the Class of 1,3-Butadiene Hydrocarbons and Haloprenes in Aqueous Emulsion in the Presence of a Compound of the Formula:**



Where R_1 Is a Hydrocarbon Radical, and R_2 Is of the Group of Hydrogen and Hydrocarbon Radicals. J. L. Parker, Louisville, Ky., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,382,813. **Vulcanizing Rubber Containing Sulphur, a Primary Organic Accelerator, and a Compound of the Formula Aryl—S—NH_2, Where Aryl Represents an Aromatic Nucleus of the Group of the Benzene and Naphthalene Series, Having a Nuclear Carbon Atom Directly Bonded to the S; the Nucleus Is Further Substituted by an Electro-Negative Group.** P. T. Paul, Naugatuck, Conn., assignor to United States Rubber Co., New York, N. Y.

2,382,838. **Polyethylene Amine Derivatives of Fossil Resins.** K. H. Weber, assignor to Armstrong Cork Linoleum Co., both of Lancaster, Pa.

2,382,867. **Reacting Alpha-Chloro-Styrene with Water in the Presence of Aqueous Hydrogen Chloride, and a Metal Chloride Dissolved Therein.** W. S. Emerson, Van Buren Township, O., assignor to Monsanto Chemical Co., St. Louis, Mo.

Dominion of Canada

429,248. **Vulcanizing Rubber in the Presence of a Dithiocarbamic Acid Derivative, for Instance, Zinc Bis (3-Ethoxy Propyl) Dithiocarbamate.** American Cyanamid Co., New York, N. Y., assignee of R. T. Dean, Stamford, Conn., both in the U.S.A.

429,249. **Vulcanizing Rubber in the Presence of a Dithiocarbamic Acid Derivative, as for Instance, Bis (2-Methoxy Ethyl) Amine Salt of Bis (2-Methoxy Ethyl) Dithiocarbamic Acid.** American Cyanamid Co., New York, N. Y., assignee of R. T. Dean, Stamford, Conn., both in the U.S.A.

429,263. **Forming a Thermoplastic Resinous Product from a Mixture of Natural Lignocelluloses, Water, and a Phenol.** Burgess Cellulose Co., Freeport, Ill., assignee of A. Schorger, Madison, Wis., both in the U.S.A.

429,265. **Resinous Product of Reaction of Ingredients Including Melamine, Formaldehyde and Bis-(Diamino S-Triazinyl) Disulphide.** Canadian General Electric Co., Ltd., Toronto, Ont., assignee of G. F. D'Alelio and J. W. Underwood, both of Pittsfield, Mass., U.S.A.

429,320. **Improving the Properties of Rubber-Like Polymers from Conjugated Diolefins by Mixing Therewith a Material Essentially Insoluble in Organic Solvents and Produced by Milling and Heating together at Temperatures between 120 and 180° C. an Oil-Modified Non-Drying Alkyd Resin and a Condensate of an Aldehyde, a Normally Liquid Alcohol in Excess, and at Least One Member of the Group of Carbamides and Amino-1.3.5-Triazines; This Condensate Is in a Form Soluble in Organic Solvents.** Resinous Products & Chemical Co., assignee of F. J. Myers, both of Philadelphia, Pa., U.S.A.

429,327. **Composition containing a Polymer from the Class of Polymerizates of Butadiene and Copolymers of Butadiene with at Least One Other Compound Polymerizable therewith Which Contains an Olefinic Linkage and, as Softening Agent, an Ether of Diglycerol wherein the Hydrogen Atom of at Least Three of the Hydroxy Groups of the Diglycerol Is Substituted by a Monovalent Hydrocarbon Radical.** Shell Development Co., San Francisco, assignee of K. E. Marple, Oakland, both in Calif., U.S.A.

429,390. **Saturated Aliphatic Aldehyde.** Canadian Kodak Co., Ltd., Toronto, Ont., assignee of M. Gallagher and R. L. Hasche, both of Kingsport, Tenn., U.S.A.

429,415. **Chlorinated Derivative of Rubber.** Hercules Powder Co., Wilmington, Del., assignee of W. H. Stevenson, Parlin, N. J., both in the U.S.A.

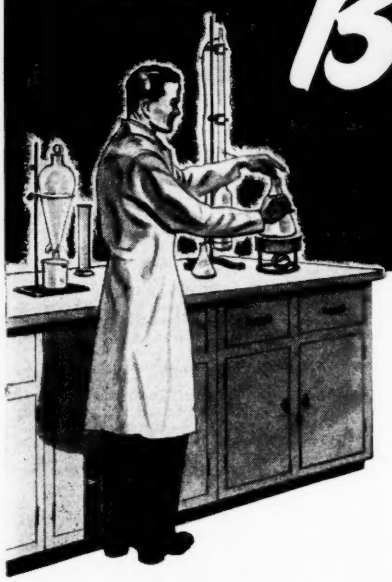
429,416. **Reducing the Viscosity of Substantially Completely Chlorinated Rubber Having a Chlorine Content of More Than 68.9% by Treating the Chlorinated Rubber in Solution in a Solvent therefor with Chlorine and an Oxygen-Containing Gas.** Hercules Powder Co., Wilmington, Del., assignee of J. M. Peterson, Kennett Square, Pa., both in the U.S.A.

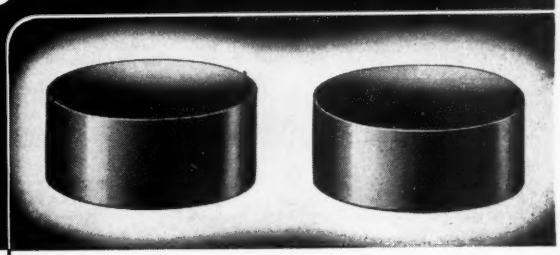
429,432. **As Vulcanization Accelerator for Rubber, the Composite Reaction Product of an Amino Thio Thiazole with a Methylol Carbamide.** Monsanto Chemical Co., St. Louis, Mo., assignee of M. W. Harman, Nitro, W. Va., both in the U.S.A.

429,473. **Treating a Thin Layer of a Non-Crystalline Saturated Linear Polyamide by Heating in the Presence of Oxygen at a Temperature between 125 and 450° C. to Obtain a Tough,**

IS COMPRESSION SET YOUR PROBLEM?

THEN Specify Butaprene N





Compression Set Test of Butaprene-N; ASTM D395-40T Method B

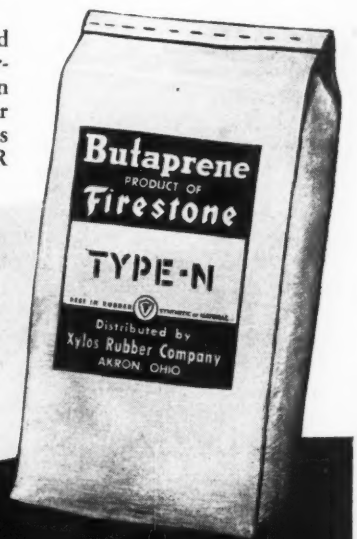
Left, pellet of Butaprene-N before test. Right, same pellet showing recovery after compressing to a 40 per cent deflection and aging for 70 hours at 212° F. Average compression set 14%.

For the best in music listen to the "Voice of Firestone" every Monday evening over N. B. C. Network

IMAGINE a rubber with a compression set of only 14 per cent*. Yes, it's here! It's Butaprene-N, the Firestone synthetic. Think what this one vital property, alone, of Butaprene-N means to product engineers who demand a permanent seal in gaskets, sleeves, packings, etc. Low compression set may mean the difference between *success* of your product and failure—between *satisfaction* and complaint.

And when you realize this same Butaprene polymer is relatively unaffected by oils or fuels, functions efficiently at below zero temperatures or in blistering heat, the importance of Butaprene-N in postwar product design takes on a new significance. Why not see what the Butaprene-N synthetics will do for you? The Butaprene technical staff will gladly advise on any problems involving the use of synthetic rubber. Simply write XYLOS RUBBER COMPANY, Akron 1, Ohio.

* Formula on request.



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THE SYNTHETIC RUBBER OF A THOUSAND USES

Resists: OIL · GASOLINE · HEAT · SUB-ZERO COLD · AGING · ABRASION

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Rubber-Like Polyamide Having Good Aging Properties. Western Electric Co., Inc., assignee of Bell Telephone Laboratories, Inc., both of New York, N. Y., assignee of C. S. Fuller, Chatham, N. J., both in the U.S.A.

429,545. Polymerizing an Aqueous Solution of Acrylic Acid and a Compound from the Group of Persulphuric, Percarbonic, Perphosphoric and Sulpho-Per-Acids, and the Free Acids, to Obtain a Water-Soluble Polymer. Canadian Industries, Ltd., Montreal, P. Q., assignee of H. R. Ditmar and D. E. Strain, both of Wilmington, Del., U.S.A.

429,546. **As a New Chemical Compound, 1,4-Dinitro-Butene-2.** Canadian Industries, Ltd., Montreal, P. Q., assignee of R. G. Franklin and F. J. Wilkins, both of Norton-on-Tees, Durham, England.

429,547. **Coating and Impregnating Composition Consisting of a Stable Dispersion of Finely Divided Synthetic Linear Polyamide of Average Particle Size not Larger Than Four Microns in a Non-Solvent for the Polyamide.** Canadian Industries, Ltd., Montreal, P. Q., assignee of W. E. Catlin, Wilmington, Del., U.S.A.

429,550. **As Vulcanization Accelerator for Rubber, a Salt of a Dimethylene Dithiocarbamic Acid, Which Salt Is Devoid of Acidic Substituents.** Canadian Industries, Ltd., Montreal, P. Q. assignee of I. Williams, Borger, Tex., and B. M. Sturgis, Pitman, N. J., both in the U.S.A.

United Kingdom

570,042. **Lactonitrile.** Imperial Chemical Industries, Ltd. (E. I. du Pont de Nemours & Co., Inc.).

570,045. **Antioxidants.** United States Rubber Co.

570,074. **Resinous Materials.** Imperial Chemical Industries, Ltd. (E. I. du Pont de Nemours & Co., Inc.).

570,088. **Material with Rubber-Like Properties from Drying Oils.** J. Williamson & Son, Ltd., and D. Beaumont.

570,104. **Stabilization of Polyvinyl Acetal.** Wingfoot Corp.

570,137. **Buoyant Rubber Compositions.** British Rubber Producers' Research Association and S. C. Stokes.

570,152. **Polymerization Treatments of Coumarone-Indene and Styrene Resins.** Refiners, Ltd., and T. Scott.

570,176. **Stabilization of Polyvinyl Acetal.** Wingfoot Corp.

570,198. **Polymerization of Vinyl Compounds.** Distillers Co., Ltd., H. P. Staudinger, K. H. W. Tuerck, and C. A. Brighton.

570,207. **Polymerization of Vinyl Compounds.** Distillers Co., Ltd., H. P. Staudinger, K. H. W. Tuerck, and C. A. Brighton.

570,216 **Esters of Chloromaleic Acid.** Wingfoot Corp.

570,232. **Antioxidants.** United States Rubber Co.

570,234. **Rubber-Like Materials.** Imperial Chemical Industries, Ltd.

570,262. **Vulcanized or Sulphurized Oil Compositions and Articles thereof.** J. A. Stokes and E. Bader.

570,263. **Copolymers.** Wingfoot Corp.

570,320. **Aqueous Dispersions from Rubbery Resins.** Semtex, Ltd., F. G. Mottershaw, L. H. Griffiths, and W. Saul.

570,326. **Interpolymerization Products.** H. Gudgeon, R. Hill, and Imperial Chemical Industries, Ltd.

570,329. **Emulsion Polymerization and Copolymerization of Methyl Alpha-Chloro-Acrylate.** E. I. du Pont de Nemours & Co., Inc.

570,330. **Emulsion Polymerization of Vinyl Halides.** E. I. du Pont de Nemours & Co., Inc.

570,331. **Interpolymerization of Vinyl Chloride with Fumaric Esters.** E. I. du Pont de Nemours & Co., Inc.

570,348. **Copolymers of Vinyl Chloride and Fumaric Esters.** E. I. du Pont de Nemours & Co., Inc.

570,358. **Polymerization Products.** H. Gudgeon, R. Hill, and Imperial Chemical Industries, Ltd.

570,367. **Resinous Compositions.** Bakelite, Ltd. (Bakelite Corp.).

570,400. **Polymerization of Organic Compounds.** Imperial Chemical Industries, Ltd. (E. I. du Pont de Nemours & Co., Inc.).

570,450. **Flame Resistant and Water Repellent Fabrics.** United States Rubber Co.

570,461. **Adhesive Compositions Including Polymerized Chloroprene.** B. B. Chemical Co., Ltd. (B. B. Chemical Co.).

570,470. **Halofluoralkanes.** E. I. du Pont de Nemours & Co., Inc.

570,519. **Butyl Alcohol and Acetone by Fermentation.** Wisconsin Alumni Research Foundation.

570,520. **Resinous Condensation Products.** British Thomson-Houston Co., Ltd.

570,563. **Low Plasticity Rubber.** J. T. Blake.

570,564. **Polymerization Products from Polymerizable Organic Chlorine Compounds.** Distillers Co., Ltd., H. P. Staudinger, and H. M. Hutchinson.

570,569. **Resinous Condensation Products from Aldehydes and Diazine Derivatives.** British Thomson-Houston Co., Ltd.

570,590. **Vinyl Resin Filaments.** American Viscose Corp.

570,596. **Copolymers.** Mathieson Alkali Works.

570,616. **Acrylonitriles.** Wingfoot Corp.

570,649. **Compositions Including Plasticized Polyamides.** E. I. du Pont de Nemours & Co., Inc.

570,650. **Polymerized Material.** Wingfoot Corp.

570,662. **Rubber-Like Material.** Imperial Chemical Industries, Ltd.

570,668. **Conversion of Vinyl-Type Halides to Aldehydes or Ketones.** Shell Development Co.

570,702. **Plasticization of Vinylchloride/Fumaric Ester Copolymers.** E. I. du Pont de Nemours & Co., Inc.

570,711. **Polymerization of Asymmetrical Dihalogenated Ethylene.** Imperial Chemical Industries, Ltd.

570,835. **Nitriles.** Shell Development Co.

570,848. **Vinyl Halides and Like Compounds.** E. I. du Pont de Nemours & Co., Inc.

570,858. **Linear Fiber-Forming Polymers.** E. I. du Pont de Nemours & Co., Inc.

570,863. **Removing Mercaptans from Hydrocarbons by Alkali Treatment in the Presence of Solubility Promoters.** Shell Development Co.

570,867. **Copolymers.** Wingfoot Corp.

570,892. **Flexible Impregnated Fabric Suitable as Substitute for Rubber or Leather.** H. Snow.

570,941. **Polymers of Vinylidene Chlorofluoride.** American Viscose Corp.

MACHINERY

United States

2,381,379. **Tire Building Apparatus.** H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,381,387. **Drying Oven for Continuous Strip Material.** S. W. Alderfer, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,381,395. **Vulcanizing Mold.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,381,401. **Tire Building Apparatus.** H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,381,866. **Injection-Type Molding Apparatus.** M. A. Crosby, Dayton, O., assignor to Hydraulic Development Corp., Inc., Wilmington, Del.

2,381,942. **Apparatus for Smoothing a Thermoplastic Coating Material.** A. M. Wickwire, Jr., Mountain Lakes, N. J., assignor to Interchemical Corp., New York, N. Y.

2,381,963. **Equipment for Tire Retreading.** A. L. Anderson, Toledo, O.

2,382,069. **Pneumatic Tire Tread Slitter.** F. Kovacs, Akron, assignor to Sieberling Rubber Co., Barberton, both in O.

2,382,177. **Apparatus for Forming and Uniting a Plurality of Plastic Materials in Composite Strip Form.** G. H. Schanz, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,382,655. **Auxiliary Scrap Feed for Plastic Molding Machines.** W. O. Nichols, assignor to Allied Plastics Co., both of Los Angeles, Calif.

2,382,672. **Tire Bead Former.** F. J. Shook, Akron, O., assignor to National-Standard Co., a corporation of Mich.

Dominion of Canada

429,474. **Charging Apparatus in an Extrusion Press.** Western Electric Co., Inc., New York, N. Y., assignee to A. J. N. Duclos, South Orange, N. J., both in the U.S.A.

429,555. **Heat Conductive Tool for Welding Thermoplastic Organic Materials.** Canadian Industries Ltd., Montreal, P. Q., assignee of E. E. Kilgour, Niagara Falls, N. Y., U.S.A., executrix of the estate of F. P. Kilgour, deceased, in his lifetime of Niagara Falls, N. Y., U.S.A.

United Kingdom

570,640. **Means for Producing Power Cable.** H. Sonnenfeld.

UNCLASSIFIED

United States

2,381,082. **Insect Repellent.** S. D. Shinkle, Passaic, N. J., assignor to United States Rubber Co., New York, N. Y.

2,381,213. **Means for Imparting Gyratory and Other Motions to Flexible Hose.** B. Forman, Stelton, N. J.

2,381,349. **Hose Clamp.** E. F. Hagen, St. Louis, and H. E. Muench, University City, both in Mo.

2,381,382. **Bead Lock.** J. E. Hale, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,381,385-2,381,386. **Constructing Containers of Metal.** M. O. Kuhn, Cuyahoga Falls, assignor to Firestone Tire & Rubber Co., Akron, both in O.

2,381,396. **Reinforced Metal Container.** M. O. Kuhn, Cuyahoga Falls, assignor to Firestone Tire & Rubber Co., Akron, both in O.

2,381,398. **Apparatus for Uniformly Stretching Rubber-Reenforcing Cord.** G. P. Bosomworth, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,381,551. **Hose Clamp.** J. Y. Morris, assignor to V. E. and A. Sprouse, copartnership doing business as V. E. Sprouse, all of Columbus, Ind.

2,381,640. **In an Airtight Tank, a Control Unit Including a Tire-Type Valve.** F. Brandstrom, Westport, Conn., assignor to Manning, Maxwell & Moore, Inc., New York, N. Y.

Dominion of Canada

429,309. **Trim Ring for Automobile Wheel.** Lyon, Inc., assignee of C. B. Aske, Jr., both of Detroit, Mich., U.S.A.

429,414. **V-Belt Fastener.** Flexible Steel Lacing Co., Chicago, Ill., assignee of W. P. Reilly, Menomonee Falls, and C. W. Tingley, Milwaukee, both in Wis., both in the U.S.A.

429,567. **Apparatus for Testing the Abrasion and Scrape Resistance of Applied Electrically Insulating Coatings on Wire.** Canadian Westinghouse Co., Ltd., Hamilton, Ont., assignee of C. B. Peale and G. R. Haywood, both of Wilkinsburg, Pa., U.S.A.

United Kingdom

569,686. **Wheel Construction.** Firestone Tire & Rubber Co.

569,772. **Resilient Wheels.** Dunlop Rubber Co., Ltd., B. W. D. Lacey and H. R. Willcocks.

570,255. **Electrical Connecting Elements.** Standard Telephones & Cables, Ltd., and L. J. Heaton-Armstrong.

570,261. **Flexible Pipe Couplings.** F. R. Stanley.

570,499. **Apparatus for Testing the Static Balance of a Body.** Dunlop Rubber Co., Ltd. C. L. S. Gilford, and J. H. Hardman.

570,815. **Connecting Means for Flexible Tubing.** H. C. Johnson.

570,876. **Electrical Connections of Heating Pads Used in Repairing Pneumatic Tires.** H. Simon, Ltd., G. W. Calvert, and G. B. Lett.

570,914. **Fittings for Small-Bore Rubber or Like Hose.** C. Brown and Amal, Ltd.

570,915. **Method of and Fluid for Use for Marking Polyvinyl Chloride Material.** English Electric Co., Ltd., E. Jones, and D. N. Hunter.

TRADE MARKS

United States

413,633. **Mold-Blok.** Brake linings. Pharis Tire & Rubber Co., Newark, O.

413,646. **"Seal Tite."** Rubber, sealing, and cushion material. C. Blum, doing business as Chase Industrial Refrigerator Equipment & Engineering Co., Norwood, O.

413,648. **Sta-Set.** Rubber cushion disks. C. Blum, doing business as Chase Industrial Refrigerator Equipment & Engineering Co., Norwood, O.

413,722. **Roadmite.** Tires. Gilmore Oil Co., Los Angeles, Calif.

413,781. **Paraspray.** Liquid coating composition for molds and cores. Foundry Rubber Compounds Corp, Washington, D. C.

413,824. **Wagum.** Synthetic rubber. H. Wagner, doing business as Wagum Distributing Co., Akron, O.

413,838. Representation of a triangle containing the letter: **"D."** Tiling. Danbury Rubber Co., Inc., Danbury, Conn.

413,857. **Thalid.** Synthetic resins. Monsanto Chemical Co., St. Louis, Mo.

413,859. **Flotofoam.** Foamed plastic material for use as a sound deadening and thermal insulation material. United States Rubber Co., New York, N. Y.

413,860. **Nubun.** Wire and cable. United States Rubber Co., New York, N. Y.

413,870. **Flex-Mor.** Moore Fabric Co., Pawtucket, R. I.

413,882. **Trailgripper.** Tires and tubes. Pharis Tire & Rubber Co., Newark, O.

413,894. **Bow Bend.** Vaginal diaphragms. Durex Products, Inc., New York, N. Y.

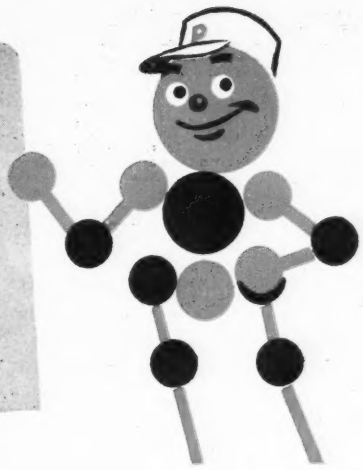
413,921. **Mahoning.** Hose and belting. Lee Rubber & Tire Corp., Youngstown, O.

413,927. **Syn-Sol.** Footwear. Spencer Shoe Corp., Boston, Mass.

If you need a General Purpose Oil Resistant Synthetic Rubber Compound...

RECIPE NUMBER	8163-4
Perbunan 26	100.0
Zinc Oxide	5.0
Stearic Acid	1.0
Medium Thermal Black	100.0
Dibutyl Phthalate	30.0
Protective Wax*	2.0
Sulfur	1.5
Benzothiazyl Disulfide	1.0

*Sunproof, Heliozone, Antisol.



PHYSICAL PROPERTIES	TENSILE P.S.I.	ELONGATION AT BREAK	LOAD AT 300% ELONGATION P.S.I.	SHORE HARDNESS	VOLUME CHANGE PER CENT
Original	1700	790	470	45	
Oven Aging 70 hrs. @ 212°F	1770	560		50	
Immersion ASTM Test Oil Number 3, 70 hrs. @ 212°F	1540	600		45	+3.
Immersion in 40% Aromatic Test Fluid SR-6 168 hrs. at room temperature	900	460		29	+34.
Immersion in Gasoline Test Fluid SR-10 168 hrs. at room temperature	1600	730		40	—0.5

Compression Set ASTM Method B	22 hrs.@158°F	23 per cent
	70 hrs.@212°F	66 per cent
Rebound (Goodyear-Healy)	@104°F	61 per cent
	@212°F	69 per cent
Tear Test ASTM D 624-44 @ Room Temperature		240 pounds per inch
Low Temperature Brittleness D 736-43T		O.K. at —55°F

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REG. U. S. PAT. OFF.

THE SYNTHETIC RUBBER THAT RESISTS OIL, COLD, HEAT AND TIME

ALTHOUGH PERBUNAN is readily adaptable to highly specialized engineering requirements, it can also be made into good all around serviceable compounds. The recipe shown here is for an inexpensive medium quality compound for miscellaneous oil resistant services. It has good physical properties which would be of interest to anyone designing stocks for the automotive industry.

YOU'RE LIKELY to find the recipe for any special synthetic rubber compound you might need in the *Perbunan Compounding and Processing Manual.* If you do not find the one which meets your needs—write or phone us today.

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413,935. **Velofoam.** Foamed sponge material. Firestone Tire & Rubber Co., doing business as Firestone Industrial Products Co., Akron, O.

413,945. **Textron.** Brassieres, baby pants, shower caps, make-up capes. Textron, Inc., Providence, R. I.

413,956. Representation of a panel with a lamb sitting on a cloud. Wearing apparel including raincoats. Rogers Peet Co., New York, N. Y.

413,957. Representation of a panel showing the rear view of a lamb. Wearing apparel including raincoats. Rogers Peet Co., New York, N. Y.

413,958. Representation of a panel showing a lamb seated. Wearing apparel including raincoats.

413,961. **Bates Originals.** Footwear. Bates Shoe Co., Webster, Mass.

413,968. The word: "Arrow" and a representation of an arrow with the words: "**Made in U.S.A.**" written across it. Garters and suspenders. Cluett, Peabody & Co., Inc., Troy, N. Y.

413,970. **Elation.** Foundation garments. Dominion Corset Co., Ltd., Quebec, P. Q., Canada.

413,989. **Cross Town.** Footwear. Vanity Shoes, Philadelphia, Pa.

413,991. **"Ah-Wa-Ga."** Footwear. Endicott Johnson Corp., Endicott, N. Y.

414,013. **Invictus.** Baby pants and shower caps. Stuart-Chase Co., North Bergen, N. J.

414,016. Representation of a rectangle superimposed on a circle and containing representation of a glove above the words: "**Advance Gloves.**" Gloves. J. Frankel, doing business as Advance Glove Mfg. Co., Detroit, Mich.

414,097. **Mallory.** Tires and inner tubes. Kotzen Tire Co., New York, N. Y.

414,144. The word: "**Me-He-Ko**" across a Representation of a Mexican. Footwear. B. Weiner, Auburn, Me.

414,153. **Arboneeld.** Demethylolurea. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

414,199 **Youth-Flex** Foundation garments. Miss America Brassiere Co., Chicago, Ill.

414,339. **"Vi-Play."** Plastic shoe soling material. Plastic Shoe Materials, Elkins Park, Pa.

414,371. **Aquatogs.** Raincoats. Kaufmann, New York, N. Y.

414,386. **Hi-Schoolers.** Footwear. Stein-Sulkis Shoe Co., Haverhill, Mass.

414,406. **Aero.** Hose and belting. Lee Rubber & Tire Corp., Youngstown, O.

414,417. **Sheddar.** Coats. Joseph & Feiss Co., Cleveland, O.

414,419. **Exylite.** Synthetic resinous material. McCoy, Jones & Co., Inc., Chicago, Ill.

414,495. **Fre-Mor.** Foundation garments. Even-Pul Foundations, Inc., New York, N. Y.

414,509. **Sulfatex.** Adhesive shoe cement medicated to prevent dermatitis. L. & R. Shoe Products Co., Haverhill, Mass.

414,516. **Larkmoor.** Footwear. Shu-Stiles, Inc., St. Louis, Mo.

414,527. **Firmtex.** Foundation garments. Lewel Mfg. Co., Inc., New York, N. Y.

Rims Approved and Branded by The Tire & Rim Association, Inc.

Rim Size	August
15" & 16" D. C. Passenger	1945
16x4.00E	196,235
16x4.25E	9,196
16x4.50E	118,355
16x5.00F	3,425
15x5.50F	15,388
16x5.50F	13,597
16x4.00E-Hump	7,080
16x5½-K	14,240
17" & Over Passenger	
18x2.15B	2,008
Flat Base Truck	
20x4.33R	21,528
20x5.00S	280,964
24x5.00S	461
15x6.00T	5,151
20x6.00T	39,675
22x6.00T	890
15x7.33V	630
18x7.33V	155
20x7.33V	45,728
22x7.33V	7,539
24x7.33V	2,194
20x8.37V	1,032
24x8.37V	880
Rim Size (*Cont'd*)	
Semi D. C. Truck	
16x4.50E	9,477
16x5.50F	7,065
Tractor & Implement	
12x3.00D	9,219
15x3.00D	17,887
21x3.00D	2,517
22x4.50E	808
18x5.50F	2,846
20x5.50F	6,522
36x6.00S	779
20x8.00T	263
24x8.00T	7,405
28x8.00T	1,357
32x8.00T	76
36x8.00T	1,259
40x8.00T	140
44x8.00T	131
W7-24	2,083
W8-24	16,538
W8-32	516
W8-36	3,299
W9-24	1,833
W9-28	978
W9-38	52
W10-24	4,349
W10-28	7,196
W10-36	10,254
W10-38	57
W10-40	827
W11-24	3,162
W11-26	1,019
W11-36	298
DW9-38	4,259
DW10-38	4,710
DW11-24	5,596
DW11-26	360
DW11-28	12,288
DW11-30	646
DW11-32	1,241
DW11-36	3,692
DW11-38	4,136
DW12-26	44
Cast	
24x15.00	40
TOTAL	943,575

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	1942		1943		1944		Seven Months Ended July, 1945	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
UNMANUFACTURED								
Crude rubber ..... *lbs.*	72,915,581	$16,943,446	45,446,802	$14,341,175	16,255,055	$ 6,531,349	13,558,228	$ 5,157,780
Latex (dry weight) ..... *lbs.*	841,695	271,222	455,213	173,777	189,492	66,519	73,141	23,542
Gutta percha ..... *lbs.*	11,925	9,662	1,431	486	1,887	596	100	99
Rubber, recovered ..... *lbs.*	28,295,900	1,947,784	20,049,900	1,453,950	19,529,700	1,372,731	14,408,400	1,041,864
Rubber, powdered, and gutta percha scrap ..... *lbs.*	5,324,000	225,949	8,183,500	244,040	4,653,500	167,920	3,668,300	129,992
Balata ..... *lbs.*	54,303	27,413	5,061	7,077	7,181	4,875	7,048	11,034
Rubber substitute and synthetic rubber.. *lbs.*	1,241,600	346,024	10,402,500	3,831,554	8,647,100	2,975,392	4,148,400	1,334,075
Total	108,685,004	$19,771,500	84,544,407	$20,052,059	49,283,915	$11,119,382	35,863,617	$ 7,698,386
PARTLY MANUFACTURED								
Hard rubber comb blanks	.....	$ 375	.....	.....	.....	.....	.....	.....
Hard rubber, in strips, sheets, rods, or tubes ..... *lbs.*	18,650	16,343	2,189	$ 3,856	5,892	$ 4,737	8,039	$ 6,332
Rubber thread, not covered ..... *lbs.*	1,093	1,129	9	15	10,082	14,216	34,306	57,375
Total	19,743	$ 17,847	2,198	$ 3,871	15,974	$ 18,953	42,345	$ 63,707
MANUFACTURED								
Bathing shoes ..... *prs.*	2,905	$ 1,103	.....	.....	.....	.....	.....	.....
Belting	.....	239,645	.....	$ 181,579	.....	$ 342,522	.....	$ 235,571
Canvas shoes with rubber soles ..... *prs.*	14,648	4,423	170	465	110	230	10	22
Boots and shoes, n.e.s. ..... *prs.*	2,880	3,542	1,683	7,275	24,068	19,061	100,746	96,445
Cement	.....	220,225	.....	132,614	.....	194,450	.....	122,377
Clothing, including waterproofed, n.e.s.	.....	33,435	.....	76,612	.....	9,670	.....	7,282
Gloves ..... *doz. prs.*	3,902	17,337	6,470	22,643	8,053	38,177	4,677	18,950
Golf balls ..... *doz.*	5,032	10,604	8,965	4,772	401	433	131	725
Heels ..... *prs.*	33,586	3,385	2,110	291	7,953	495	1,850	144
Hose	.....	285,465	.....	243,947	.....	249,769	.....	218,235
Hot water bottles	.....	17,460	.....	9,620	.....	12,357	.....	5,176
Liquid sealing compound	.....	42,369	.....	36,964	.....	100,941	.....	59,356
Mats and matting	.....	74,939	.....	11,873	.....	15,540	.....	49,780
Packing	.....	145,335	.....	103,887	.....	74,194	1	88,102
Raincoats ..... *no.*	54,428	312,541	71,125	520,345	68,498	511,789		12
Tire repair material	.....	.....	.....	.....	.....	.....	.....	72,287
Tires, bicycle ..... *no.*	4,039	2,717	11,212	9,854	9,541	10,284	6,902	7,414
Pneumatic ..... *no.*	2,886	81,706	4,093	68,376	1,197	55,209	807	40,877
Solid, for automobiles and motor trucks *no.*	332	22,877	254	9,560	177	8,159	190	6,814
Other ..... *no.*	.....	13,366	.....	11,231	.....	9,625	.....	8,899
Inner tubes, bicycle ..... *no.*	5,637	1,524	4,649	1,752	3,542	1,503	5,038	2,834
Other ..... *no.*	1,607	11,566	1,049	6,589	6,255	20,620	709	3,023
Gaskets and washers	.....	.....	.....	.....	.....	97,359	.....	85,661
Nursing nipples ..... *gross*	.....	.....	.....	.....	.....	.....	4,139	14,832
Druggists' sundries	.....	.....	.....	.....	.....	295,949	.....	266,185
Other rubber and gutta percha manufactures	.....	1,801,158*	.....	1,404,788*	.....	1,452,509	.....	1,174,573
Total	.....	$ 3,346,722	.....	$ 2,865,037	.....	$ 3,520,845	.....	$ 2,585,576
Total rubber imports	.....	$23,136,069	.....	$22,920,967	.....	$14,659,180	.....	$10,347,669

* Includes gaskets, washers, and druggists' sundries.



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...KIMUM COLOR-STABILITY
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an elasticator* for GR-S

More than two years of experience in scores of plants have definitely proved the advantages of Circosol-2XH, the new "Elasticator" and plasticizer for GR-S.

Thousands of gallons are now being used for tires, camelback, proofgoods, mechanical goods, footwear, soles, and heels. From leading rubber-processors in all parts of the country comes the evidence that to all vulcanizates of GR-S, this new, revolutionary processing-aid imparts increased resilience, plus greater resistance to flex-cracking and heat build-up.

For full information on Circosol-2XH and other new Sun products for the rubber industry, write for free booklet.

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* The word "ELASTICATOR" denotes the property of a processing aid which is capable of developing an unusual degree of resilience in GR-S Vulcanizates.



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HIGH RESILIENCE



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SPEEDS PROCESSING...
SAVES RUBBER



FOOTWEAR
UNEXCELLED PROCESSIBILITY...
HIGH FLEX-CRACKING RESISTANC

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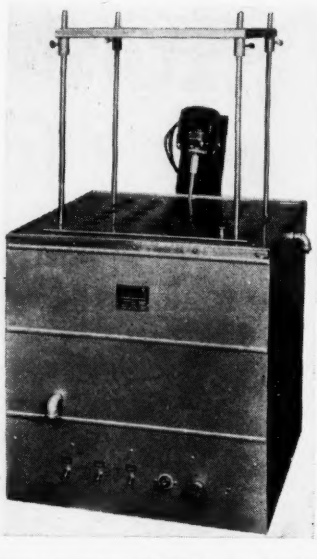
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CABLE ADDRESS "COSTAN" AKRON

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AKRON 9, OHIO

New Machines and Appliances



New Precision Scientific Oil Immersion-Type Bath

New Oil Immersion-Type Aging Bath

THE Precision Scientific Co., 1750 N. Sringfield Ave., Chicago 47, Ill., has developed a new aging bath which is specifically designed for use, when performing aging tests on rubber and rubber-like synthetic materials according to the A.S.T.M. specifications D-471 and D-735. These tests are intended to estimate the comparative ability of rubber and of synthetic rubber-like materials to withstand immersion in oils and liquids (D-471) and their resistance to heat and air aging (D-735). The latter procedure was developed and described recently.[1]

The new aging bath, which is of the circulating oil type, has provisions for 24 test tubes 33 millimeters in diameter by 200 or 300 millimeters in lengths. The test tubes are supported in an adjustable rack, which is removable, made of stainless steel, and rests directly in the bath. The top shelf of the rack is constructed in such manner that if it is used in tests according to A.S.T.M. specifications D-471, the condensers are guided in a vertical position by the rack.

The temperature of the bath is adjustable from 35° C. up to 200° C. within ± 1° C. A steel-sheathed immersion heater used in connection with an adjustable hydraulic thermostat controls the heat of the bath uniformly; while a ball-bearing stirrer assures complete circulation. The bath is made of stainless steel; the exterior is of galvanealed iron, finished in high-temperature aluminum. The sides and the bottom are insulated with three inches of glass wool.

[1] "High Temperature Oven Aging of Oil-Resisting Synthetic Rubber Compounds." G. D. McCarthy, A. E. Juve, H. Boxser, M. Sanger, S. R. Doner, E. N. Cunningham, J. F. McWhorter, and R. H. Crossley, *A.S.T.M. Bulletin*, Jan., 1945, p. 33. See also INDIA RUBBER WORLD, July, 1945, p. 467.

RMP ANTIMONY FOR RED RUBBER

. . . . The utmost in pleasing appearance with no deteriorating effect whatever.

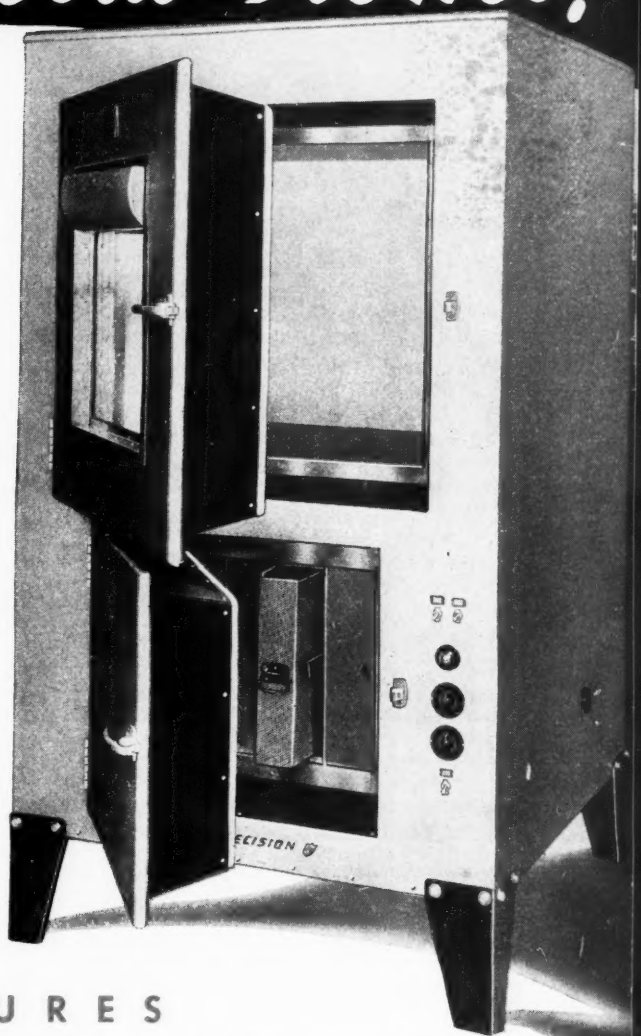
RARE METAL PRODUCTS CO.
BELLEVILLE, N. J.



FOR EASY PROCESSING, USE PHILBLACK A

(FOR FURTHER DETAILS, SEE AD ON PAGE 4)

It's New..It's Cold..It's Hot!



VARI-TEMP
CABINET

8 cu. ft. or 1 cu. ft. capacity
Temp. range —90° F. to +220° F.

This "Precision" Vari-Temp Cabinet operates with dry ice and was designed and developed to satisfy all the cold test conditions encountered and required by present day testing techniques, from —90° F. to +220° F. The vertical cabinet design with the large door provides easy access to a spacious chamber, sufficiently large to hold the various types of apparatus used for the tests. It will also accommodate the apparatus used in making the Young's Modulus test of natural and synthetic elastomers at normal and sub-normal temperatures, to ASTM D-797. The apparatus and specimens under test are readily visible at all times since there is no frosting or condensation on the surface of the observation window.

The incorporation of a heating unit in this cold chamber allows a full temperature testing range of from —90° F. to +220° F. The temperature is held at ±1° F. by individual regulators for the low temperature tests and for the high temperature tests.

Ample space has been allowed for the placement of apparatus in the cold chamber, a full 8 cu. ft. being available. Special apparatus can be mounted by means of holes, which can be drilled directly into the outer shell when necessary, as well as over the entire area of the bottom of the test chamber.

FEATURES

This "Precision" Vari-Temp Cabinet is of extremely rugged construction throughout, and is made to give years of service. The special construction and arrangement of the ducts prevent the carbon dioxide gas from entering the specimen test chamber. Mechanical convection provides uniform temperature.



Thermal losses are kept at a minimum by completely insulating the inner wall from the outer wall.

Metal plates 4" wide, the height of the chamber, are centered on each side of the rear, and on the top, to provide facilities for mounting the apparatus from any of these positions.

Insulating tubes prevent dissipation of cold from the inner chamber.

Heavy gage tinned copper has been used in all parts liable to corrosion due to condensation.

All temperatures are controlled thermostatically, one thermostat being provided for low temperatures, and one for high temperatures.

This cabinet is attractively finished in anti-corrosive aluminum.

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over twenty years catering to rubber manufacturers

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of the entire rubber industry

KNOWLEDGE

of the industry's needs

QUALITY

acknowledged superior by all users are important and valuable considerations to the consumer.

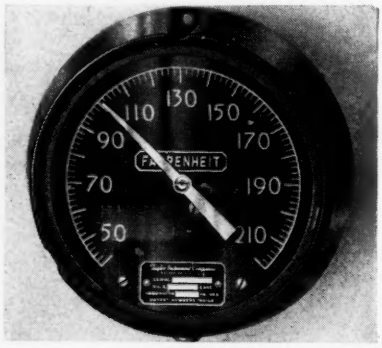
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CLAREMONT WASTE MFG. CO.

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The Country's Leading Makers

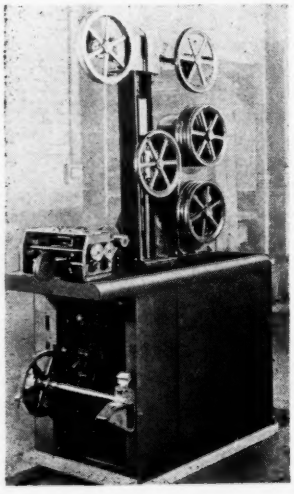
The dimensions of the bath are: 49 inches high, 24 inches wide, and 24 inches deep. The electric characteristics are 115 volts, 16 cycles a.c., and 3,000 watts. The bath has an oil capacity of 19 gallons. The bath can also be used for general work, as the condenser tube rack and the test-tube holders can easily be removed.



Face of Remote-Reading Thermometer

Remote-Reading Dial Thermometer

A NEW remote-reading dial thermometer has been announced by the Taylor Instrument Cos., Rochester, N. Y. This instrument is a 4½-inch dial thermometer, which is mercury actuated. Built to withstand severe operating conditions, the thermometer is available with Accuratus tubing well suited to use where a long distance is interposed between the dial and the bulb. To make reading from the distance easy the dial is finished in black and white. There are ten available reading ranges for the thermometer covering temperatures from —40° to 900° F.



A Heavy-Duty Wind-Up Machine

Improved Wind-Up Machine

A NEW type of heavy-duty wind-up machine for the constant speed, constant-tension winding of large-diameter wire, cable, cords, rope, hose, and other continuous materials has been developed by the Industrial Oven Engineering Co. This machine will handle materials up to 1½ inches. Standard speed ranges for the machine are 25 to 150, 40 to 200, and 60 to 240 feet per minute, and the tension values are from 5 to 1,000 pounds. The machine is motor driven and requires no outside source of power. The standard model employs a 42-inch reel, but a special size equipped to take a 60-inch reel is available. The input of horse power varies with the speed and tension which are attained. The standard unit with sheaves, such as those in the accompanying illustration, is used for constant tension, constant-speed single-reel take-up of large-diameter cable after extrusion jacketing, braid saturation, and cable stranding or bunching.

Tire Factories for New Zealand

New Zealand is to have its first tire factories shortly. The New Zealand Bureau of Industry has granted licenses to three corporations to start tire factories here: the Firestone Tire & Rubber Co. of New Zealand, the Dunlop Rubber Co. of New Zealand, and Reid New Zealand Rubber Mills. Reid will extend its existing works considerably, but the other two concerns are to build entirely new plants. Full production is not expected until early 1947. It is pointed out that American firms have a share in all three of the new undertakings since Goodyear has affiliations with Dunlop and a minority interest in the Reid company is said to be held by Goodrich.

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Adhesives compounded with Staybelite* Esters *retain their tackiness* over long periods  ...as proved by aging tests in oxygen bombs, and exposures to high temperatures  and humidities. Thus, these Esters are widely used in  surgical, masking, and transparent tapes, shoe adhesives and the like. The Staybelite Esters are neutral, nonreactive, nonoxidizing, and show little tendency to crystallize on aging, even in the compounded adhesive  They are compatible with Vistanex, GR-S, GR-I, Neoprene, reclaimed rubbers. They are readily milled, and may be easily dispersed in aqueous systems, which facilitates their use with GR-S or Neoprene latexes. Hercules invites you to explore the possibilities  of the Staybelite Esters. Write Synthetics Dept., ***HERCULES POWDER COMPANY***, 914 Market St., Wilmington 99, Del.

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EUROPE

GREAT BRITAIN

Dunlop and the War

Immediately after the outbreak of hostilities Dunlop Rubber Co., Ltd., placed itself wholeheartedly at the disposal of the British Government and now has decided to publish the story of its contribution to the war effort. It also arranged the Dunlop War Exhibition in London from July 2-13, showing about 400 different products made by the 35 Dunlop factories in Great Britain and overseas for the war.

One of the most interesting articles on display was a reproduction in miniature of the huge pneumatic wave controllers specially designed and made for controlling the waves on the Normandy beachhead at the time of the invasion. These breakwaters were made of inflatable rubber and each unit was 200 feet long, 25 feet high, and weighed 700 tons.

Then there were the Franks flying suits, constructed with a rubber bag interlining and designed to increase the British pilot's resistance to "blackout" so that he was able to go through maneuvers no enemy could follow; also very lightweight inflatable suits of fine rubberized fabric said to give complete protection to an airman forced to come down over water. Other life-saving devices included three types of rubber dinghies, one type for bomber crews built to carry seven men, a fighter pilot's pack, and a fully-rigged sailing dinghy. Barrage and leaflet dropping balloons, new types of tires, including bullet-proof tires and sand track tires specially developed by Dunlop for the war effort, rubber airplane parts and various other articles too numerous to itemize were also shown.

At the opening of the exhibition, Sir George Beharrell, chairman of the company, gave figures of the quantities of some types of war goods made by Dunlop: one million tank tires, one million lifebelts, 3,000 miles of rubber tubing for the most varied purposes ranging from detonators to blood transfusion apparatus, 9,000 miles of stirrup pump hose, 600,000 pairs of anti-gas gloves; 600,000 airplane wheels, 450 airplane pneumatic brakes, 15,000,000 cycle and motorcycle rims, 750 tank and Bren gun wheels, 2,500,000 light and heavy disk wheels.

Dunlop made net profits of £2,615,700 in 1944, as compared with £2,765,797 for 1943, it was announced at the forty-sixth general meeting of the company held June 8 in London. The 1944 figure includes abnormal items which result in a net credit of £74,114.

In his statement circulated with the company's report, Sir George said that though there was a substantial increase in the turnover in the tire division and in airplane equipment, the use of synthetic rubber and the need of employing inexperienced labor had increased costs. The rubber goods division on the whole was able to maintain the favorable volume and profit of 1943, but labor shortage affected the net profits of the garment factory; while the footwear and sports division continued to suffer from the concentration of their industries and lack of materials. Labor shortages also still cause difficulties in the cotton mills.

In spite of the restrictions introduced after Pearl Harbor, satisfactory results are reported from export trade. Sir George here emphasized that the company fully realized the urgent importance of developing its export business and was ready to play its part as soon as circumstances permitted.

The overseas factories also showed good results; the Indian and South African companies again reported a successful year, as did the American company. Increased costs without a corresponding increase in price reduced the Canadian company's profit, and war causes cut into the profits of the Irish firm.

In reply to questions on synthetic rubber, Sir George said: "I do not think that at present synthetic rubber can compare at all in quality with natural rubber for the manufacture of tires, and I do not believe that any manufacturer would willingly use synthetic rubber to any extent if natural rubber were available. In fact, it is ever present in our minds that when more natural crude rubber becomes available, we shall perforce have to let the Americans have some, as otherwise they would be so handicapped that a very difficult situation might arise."

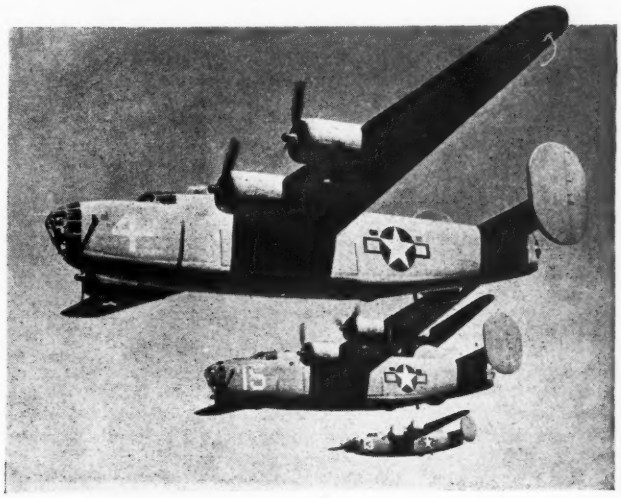
For the first time in its history, Dunlop has appointed a deputy chairman, Sir Clive L. Baillieu, who has been a director of Dunlop since 1929 and is also president of the Federation of British Industries. He recently resigned the chairmanship of the Fairey Aviation Co.

New Line of S/V Sovaloids Meets Many Synthetic Rubber Processing Needs!

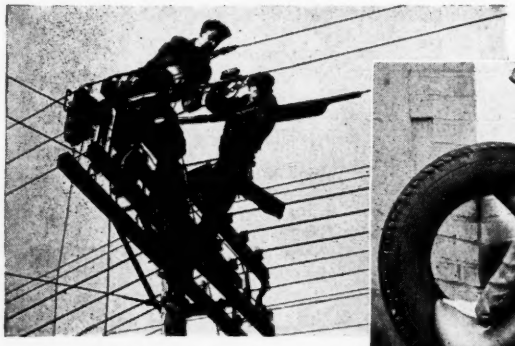
To speed and improve synthetic rubber compounding, the Socony-Vacuum Oil Company has developed a new line of hydrocarbon plasticizers known as the S/V Sovaloids.

The new plasticizers, already in use in many mills, possess special characteristics that are entirely different from those of plasticizers previously obtained from petroleum. These special properties fit them particularly for the processing of many synthetic rubber compounds.

The S/V Sovaloids are available now in a number of different grades, covering the processing of many types of synthetic rubber. The captions under the pictures on this page give some of the advantages of four grades of Sovaloids. See your Socony-Vacuum Representative for facts and figures, and assistance on applications to your operations.



S/V SOVALOID L, makes Neoprene flexible at extreme low temperatures (down to minus 60° F.). Thus, it is invaluable in processing Neoprene for such uses as airplane parts.



S/V SOVALOID C, helps produce smooth GR-S stocks with excellent dielectric properties. It is an aid in processing extruded and calendered stocks such as cable castings. It cuts milling and compounding time.



S/V SOVALOID A, improves processing of stock for innertubes and many other items. It speeds breakdown on the mill, minimizes sticking and is useful in lubricating extruded compounds.



S/V SOVALOID N, is recommended for use in Neoprene compounds requiring large amounts of softener without subsequent blooming, such as those used in printing rolls. It is also a plasticizer for other more conventional Neoprene compounds.

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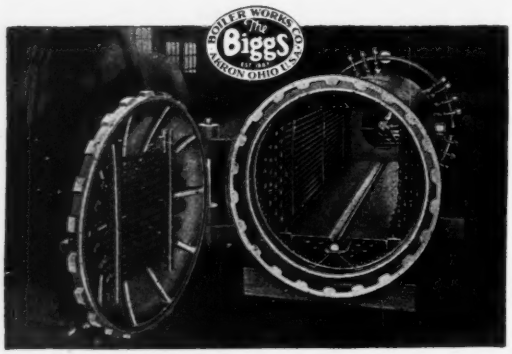
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More on Malayan Rehabilitation

More than a year ago the Rubber Growers' Association appointed a special rehabilitation committee to work out a scheme for dealing with the rehabilitation of Malayan rubber estates in the early stages after liberation. Some months ago Sir John Hay gave certain details of the scheme as finally formulated, and now we learn that a control-cooperative organization has been created to operate the scheme: namely, the Malayan Rubber Estate Owners Co., Ltd. It was registered July 14, 1945, as a company limited by guarantee without share capital, with an unlimited number of members, each liable for £1 in the event of winding up. Objects: To assist and promote all necessary measures in connection with or arising out of the rehabilitation or reorganization of the rubber producing industry in Malaya, and for that purpose to obtain and collect reports, data, and information, to devise schemes for allocation among members of stores, estate supplies, foodstuffs, and equipment, and train and employ rubber planters, to make arrangements for medical supplies, transport charterers, brokers, merchants, and agents, etc. Subscribers: F. D. Ascoli, chairman and director of Dunlop Malayan Estates, Ltd; T. B. Barlow, partner of Thomas Barlow & Bro.; T. J. Cumming, director, Seafield Rubber Co., Ltd.; H. B. E. Hake, director of Anglo-Malay Rubber Co., Ltd.; John G. Hay, chairman and managing director, Guthrie & Co., Ltd.; C. Mann, director, United Sua Betong Rubber Estates, Ltd.; H. Eric Miller, East India Merchant, J. L. Milne, director, Merlimau Pegoh, Ltd.; T. Taylor, director, North Malay Rubber Estates, Ltd.

The members are to associate themselves in groups, each group consisting of a member or members owning and including in the group not less than 100,000 acres planted with rubber trees. The directors are to be the chairmen of each group and any others (up to five) appointed by the board. Any group owning 200,000 planted acres may appoint an additional director. It may be added that members of the company are to be owners of estates of 100 acres and over. The government has undertaken to care for the needs of small holdings of less than 100 acres.

The company has the full support of the Colonial Office, and the government will deal with it in regard to priorities and arrangements for the importation, delivery, and distribution in Malaya of the supplies, equipment, and services required. The company will have practically a monopoly in these things.

With the cooperation of the Colonial Office, an inspection party is to be sent to Malaya as soon as permitted by the military authorities in order to inspect and report on the condition of estates. The findings of this inspection party will influence distribution of staff, labor, supplies, etc., so that while in principle a fair distribution of goods and services to all is aimed at, in practice—because of the necessity for concentration of estate operations to speed production—the conditions of estates will be the factors governing the extent of allocations.

In the first phase of liberation, the government will act as buyer for export of all rubber available.

Rubber Men Honored

Members of various branches of the rubber and allied industries were included in the Birthday Honors List. R. D. Denman, chairman and director of a number of rubber plantation companies, was created a baronet. Knighthoods were conferred on T. A. Eades, vice chairman and managing director of Automatic Telephones & Electric Co. and director of British Insulated Cables & Telephones, and Telephone & General Trust, and on C. B. L. Tennyson, chairman of the board of governors, National Register of Industrial Art Designers and a director of the Clipper Tire Co. The O. B. E. was received by F. T. Jackson, managing director of Telephone Mfg. Co., Ltd.; A. W. Montgomery, technical director of Standard Telephones & Cables, Ltd.; and C. Riley, sales manager of General Electric Co. The British Empire Medal (Civil) was awarded to L. C. Gosling, foreman of the tire examination shop of Auto Tire Services, Ltd., and to W. J. Cadden, section manager, Dunlop Rubber Co., Ltd.; Mrs. N. Harris, suction hose maker, Wm. Warne & Co.; Mrs. A. Meredith, operator sheet rolls, British Insulated Cables, Ltd.; and J. H. Naylor, production foreman, and W. Ogden, process worker, both of Imperial Chemical Industries, Ltd.

In Britain's recently held general election, several representatives of the rubber industry were elected members of Parliament. Sir John Denman Barlow, Bt., partner of Thomas Barlow & Bro., East India merchant, of London and Manchester, and also of Barlow & Co., Singapore and Kuala Lumpur, was returned for the Eddisbury Division of Chester, gaining a seat for the Liberal-National party. Sir John is also a director of Barclay's Bank (Manchester and District local board), Manchester Chamber of Commerce, and of various plantation companies in the Far East, including rubber companies in Malaya and Borneo.



The C. P. Hall Co.

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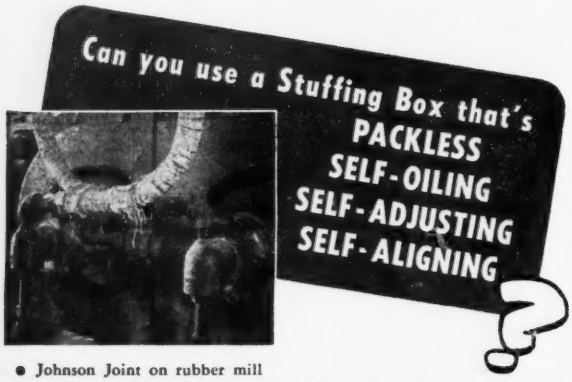
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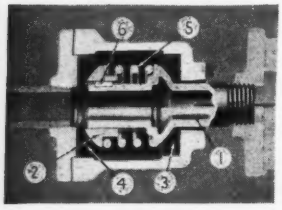
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• Nipple (1), fastened to roll or drum. Sliding collar (2), keyed (6) to nipple. Carbon graphite seal ring (3) and bearing ring (4) eliminate oiling and packing. Spring (5) is for initial seating only; joint is pressure sealed.

IF you have a problem that has to do with getting steam, or liquids under pressure, into rotating machine parts, don't overlook the possibilities of the Johnson Rotary Pressure Joint.

It is being used on Paper Making and Textile machinery, in cold strip steel mills, on machine tools, and for an increasingly wide range of other applications. So completely does it outmode the old style stuffing box that industry has already adopted over 50,000 Johnson Joints in the few years since their development.

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John Lewis, managing director of Rubber Improvement, Ltd., London, has been elected as member of Parliament for Bolton. Mr. Lewis, only 32 years old, has been interested in politics, on the side of labor, since he was 15. During the war he was responsible for essential production and invented several processes which contributed importantly to the conservation of crude rubber, including the rubber chippings runway adopted by the Air Ministry and used with great success until the utilization of scrap rubber for this purpose was prohibited. Together with the technical department of the Limmer & Trinidad Lake Asphalt Co., Ltd., he developed "Rilata," an elasticized asphalt designed for the rubber and cable industries. He was also a pioneer of high-temperature reclaiming process in England sponsored by the Ministry of Supply. Following a report on the Rubber Control Board made by him in 1942, at the request of the Minister of Supply, many valuable changes were made. Mr. Lewis believes that the prosperity of the rubber industry will largely be determined by industrial and technical development and research, and further that government should take active steps to make these desiderata available.

Walter Fletcher, chairman and managing director of the firm of crude rubber merchants, Hecht, Levis & Kahn, held Bury for the Conservatives.

Personal Notes

C. H. Birkitt, recently released from his important government executive appointment, has joined Hubron Rubber Chemicals, Ltd., Failsworth, Manchester, as research and development manager.

Percy Dunsheath has been elected president of the Institution of Electrical Engineers for the coming year. Dr. Dunsheath is a director and chief engineer of W. T. Henley's Telegraph Works Co., Ltd., and a director of Henley's Tire & Rubber, Ltd., and of Holborn Construction Co., Ltd.

Charles Tennyson, secretary of Dunlop Rubber Co., Ltd., was knighted early in July in recognition of his work as chairman of the Central Institute of Art & Design, and the National Register of Industrial Art Design. He did much toward bringing designers in touch with industry for the improvement of standards at home and of exports abroad. Sir Charles is a grandson of the English poet, Alfred Tennyson.

The Society of Chemical Industry announces among its new members; R. P. Dinsmore, of Goodyear Tire & Rubber Co., Akron, O.; H. E. Fritz, of The B. F. Goodrich Co., Akron, O.; and N. W. Krasse, of E. I. du Pont de Nemours & Co., London.

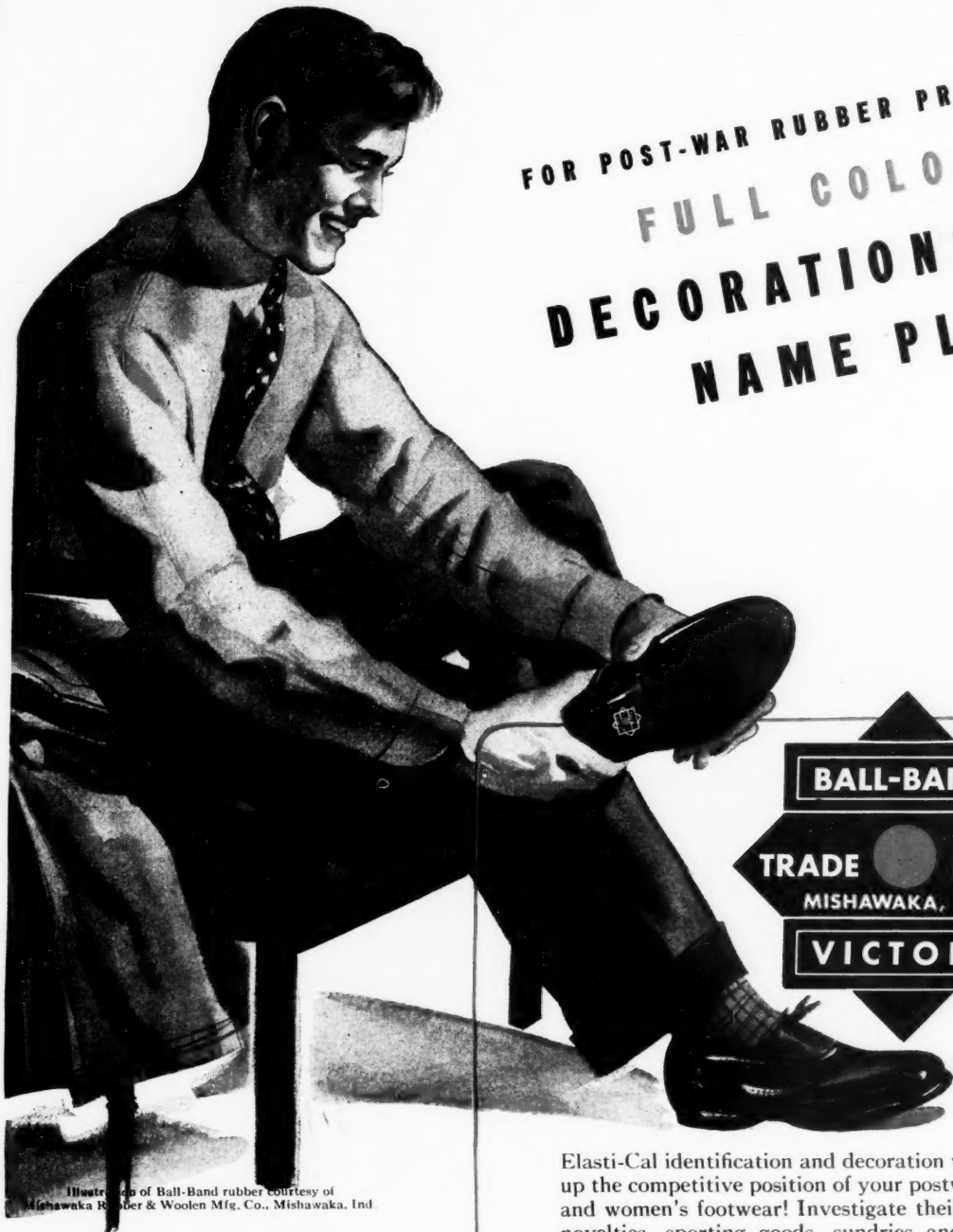
F. H. Cotton, well-known rubber technologist, is among the recipients of the Leverhulme Research Grants for 1945. The award will enable Mr. Cotton to make an intensive study of recent developments in rubber technology and the production of rubbers and allied plastics in Britain, America, and, if time permits, also in Russia. Mr. Cotton, lecturer in rubber technology at the Northern Polytechnic, London, since 1928, has been granted a year's leave of absence to start soon after Christmas. He plans to spend two months visiting factories in the United Kingdom and will then proceed to America where he hopes to meet rubber technologists, chemists, and physicists in the United States and Canada and to be able to assess the value and possible applications of materials and processes developed there during the war. If there is time, Mr. Cotton would also like to see the advances that have been made in the rubber industry in Russia. He states that he will welcome cooperation in his research and assistance in making the necessary personal contacts in Britain, America, and Russia.

Other British Industry News

British Engineers' Small Tools & Equipment Co., Ltd., (Bestec), London, recently was formed for the sole purpose of developing the export sales of various well-known British manufacturers: Brooke Tool Mfg. Co., Ltd.; Coventry Gauge & Tool Co., Ltd.; A. A. Jones & Shipman, Ltd.; F. Pratt & Co.; Taylor, Taylor & Hobson, Ltd.; and E. R. Watts & Son, Ltd. The new company is under the chairmanship of H. H. Harley, chairman and managing director of Coventry Gauge & Tool.

In reply to a question in the House of Lords, the Secretary to the Overseas Trade Department, S. Summers, replied that it was not considered advisable to hold a British Industries Fair in 1946, but that plans were under way for a Fair to be held in 1947 with emphasis on exports so as to assist British export trade to the utmost.

The Geigy Color Co., Ltd., Manchester, has changed its name to The Geigy Co., Ltd. This firm, which originally specialized in colors for various purposes, has gradually expanded its activities and now also makes plasticizers particularly for use with polyvinyl chloride and like materials.



FOR POST-WAR RUBBER PRODUCTS

FULL COLOR DECORATIONS and NAME PLATES

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TRADE MARK
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VICTORY

Illustration of Ball-Band rubber courtesy of Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind.

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WITH THE INCREASED USE OF **SYNTHETICS** WE HAVE BEEN ASKED TO SUPPLY BOTH STANDARD AND SPECIAL EQUIPMENT FOR THE CUTTING, GRINDING, TRIMMING, ETC., OF THE MANY COMPOUNDS NOW IN USE AND WILL WELCOME YOUR INQUIRIES DEALING WITH THESE AND KINDRED OPERATIONS.

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The manufacture of tennis and golf balls from synthetic rubber for civilian use is now permitted, but only very limited amounts will become available for the present. Because of the shortage of natural rubber, neither tennis nor golf balls had been made during the last three to four years.

For the week ending August 4, members of the Dominion Forces interested in rubber were offered a course dealing with the rubber industry. The course was organized by the British Council in cooperation with the Ministry of Supply and was given in the University Overseas Club, Birmingham, which was founded by the Guild of Undergraduates and the British Council for men and women of the Dominion and Allied Forces from overseas and for graduates and undergraduates of the University of Birmingham. Introductory lectures and a survey of the rubber industry in Britain were presented, and on succeeding days visits were organized to the Goodyear Tire & Rubber Co., Ltd., Wolverhampton, the British Tire & Rubber Co., Ltd., at Burton-on-Trent, and Dunlop Rubber Co., Ltd., Erdington.

Delaron, made by De La Rue Insulation, Ltd., London, is an industrial material made from layers of paper or fabric impregnated with phenol-formaldehyde in liquid form. The layers are subjected to high-temperature and pressure in a hydraulic press until the liquid resin has polymerized and a homogeneous mass is produced. The product is said to have excellent structural and electrical properties and is expected to be widely used in the radio and electrical equipment industries, in aircraft, marine engineering, textile manufacturing, and steel making. At present it is employed in practically every type of field operational equipment in the services.

Perspex is a clear transparent methyl-methacrylate sheet material made by Imperial Chemical Industries, Ltd., for use in electrical fittings, buttons, and household articles. It has recently been released for civilian use in the United Kingdom.

So many American firms seem to be planning manufacturing centers in Great Britain that the American Chamber of Commerce in London has thought it advisable to issue a circular stating the attitude the British Government is likely to adopt toward such enterprises. It is pointed out that British manufacturers whose activities were restricted or suspended during the war will be given priority to establish themselves before newcomers enter the field. Again, while the government is expected to welcome new industries and new manufacturing processes, these will probably be diverted to the so-called "Development Areas," such as South and North Wales, the North-East Coast, and parts of industrial Scotland. Finally, since Britain must recover her export trade, any new business capable of contributing to this end is expected to be encouraged to establish itself in Great Britain.

The recently formed British Export Trade Research Organization (known as B.E.T.R.O.) went into operation in the latter part of July when a meeting was held attended by 50 leading members of British commercial circles, representing some of the leading firms in the country with a total capital of several hundred million pounds. In the course of the meeting it was suggested that industry should provide the new organization with £300,000 to £500,000 a year to carry out its important work. Among the members of the organization's council are J. L. Graham, for Dunlop Rubber Co., Ltd.; N. G. Pehrson, for Turner & Newall, Ltd.; and Lt. Col. L. J. Barley, Imperial Chemical Industries, Ltd. The Organization has 98 elected founder members. In addition 98 firms representing various industries have applied for ordinary membership.

Britain is becoming increasingly conscious of the need of research to aid industry and, as further proof, may be mentioned the proposal of the Federation of British Industries Grand Council to hold a two-day conference on "Industry and Research." Special emphasis will be laid on the practical means by which research can assist industry and promote industrial efficiency, exports, full employment, and a higher standard of living.

FRANCE

Reports received via England on the French rubber industry make it clear that owing to American aid it was possible to increase tire output in the first five months of 1945, when five companies, Renault, Dunlop, Michelin, Englebert, and Bergougnan, together produced 325,000 tires, of which 127,000 went to the American army. Compared with outputs during the base year 1938 which are taken as 100, production in January, 1945, was only 10, but rose to 31 in March, 1945.

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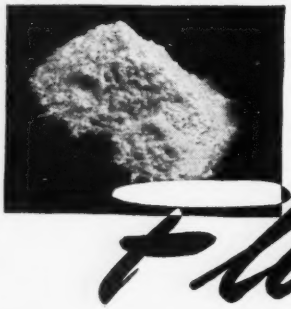
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America stopped supplying France's rubber needs on July 1, leaving, however, stocks enough for two months. With the surrender of Japan, France may hope to begin to receive supplies of natural rubber from Indo-China shortly, but apparently nothing from Africa, since all rubber obtained from the latter source till the end of 1945 is supposed to go to the United States.

The Indo-China rubber should be especially welcome as it is understood the French Government intends to expand existing plants in France. Meanwhile the amount and variety of rubber goods allowed to be manufactured for civilian use is strictly limited. It is still very difficult for civilians to get tires; the position seems to be somewhat easier with regard to hygienic goods, although naturally hospitals have first call; small quantities of rubber tubing and a few other essential articles are also appearing. But it is forbidden to manufacture certain items including rubber pedals for bicycles and rubber mats.

The rate of progress in rubber manufacture is retarded not only by lack of raw material, but by a serious coal shortage—a shortage hampering all manufacturing and distribution activities in France.

The scarcity of natural rubber caused France also to experiment with *kok-saghyz* rubber, it is learned. Whether the tests were started under the Germans or after the liberation is not specified. However this work, carried out at Nogent-sur-Marne, indicated that between 3.3 to 10.4% of rubber could be extracted from the locally grown *kok-saghyz* and that the rubber had a breaking point of 250 kg/sq.cm., and elongation of 500%. Despite what are considered satisfactory results, it was decided not to expand cultivation of the plant because that would require larger areas than are available, and weeding created difficulties. Now one might say, there is the final and conclusive reason—the imminent arrival of natural rubber from French Indo-China.

Etablissements Hutchinson recently issued its annual report, which stated that lack of rubber and coal limited output during the occupation to 30% of capacity. The company's branch in Mannheim, Germany, has been completely destroyed; while the factory at Milan, Industria Gomma, has been badly bombed. On the other hand the Madrid branch, Societa Hutchinson Industria del Caucho, reports that it is making small profits despite the difficult raw material situation. The French parent company was supposed to hand over part of the shares of the Italian and Spanish enterprises to the Semperit Gummi Werke of Vienna in return for raw materials. The seizure of the Italian factories after the creation of the Republican Fascist State fortunately prevented the completion of this transaction as far as the Italian companies were concerned but there was no intervention to save the shares of the Spanish enterprise.

Even before Japan's surrender, reports indicated that it was not likely that a serious effort would be made to produce synthetic rubber on anything like a substantial scale in France. Instead the French were putting their hopes and their efforts in rubber from their colonies in Africa, and plans were formulated to increase rubber production there. At an official conference held in Dakar in February, 1945, a target had been set for the production of various French West Africa crops during 1945-46, and the goal for exports of rubber from these parts had been put at 3,487 metric tons. Now with the near prospect of abundant, high-grade rubber from Indo-China, it may be assumed that such plans for synthetic rubber as had been worked out will for the most part be shelved, and a slackening in the interest in African rubber may probably also be looked for.

While France has never shown much interest in the production of synthetic rubber, the manufacture of various synthetic plastics was established before the war. During the occupation, activities in this direction were necessarily intensified and various rubber-like polyvinyl plastics were developed, including "Thiogomme" and Dunlop's "Plastogil." Chemical concerns like Kuhlmann and Saint-Gobain have also been making synthetic plastics; the latter is marketing a material known as "Gobanil."

Revival of manufacturing continues to be slow in most if not all industries, including the rubber industry. Much of the existing equipment in French factories is old, more or less obsolete, and in poor condition, and besides a serious lack of spare parts exists. The shortage of mechanical rubber goods helps produce a vicious circle. Production of coal in a certain area, for instance, is said to be hampered because the rubber conveyer belts have deteriorated to such an extent that breakdowns are frequent; while rubber and chemical factories have to slow down because coal is scarce. Moreover the scarcity of rubber mechanicals also impedes the operations of factories more directly concerned in their manufacture. Thus a Lyons branch of a large chemical concern must operate at low levels because rubber joints are among the many shortages listed by the firm.

The Comité Supérieur des Inventions de la Propriété Industrielle has reportedly been formed in Paris to aid French inventors and to promote research.

EUROPEAN NOTES

I. G. Farbenindustrie, A.G., in the American occupation zone in Germany, has been seized by the United States Military Government. Until the Allied Control Authority has decided on its ultimate disposition, the concern will be under the direction of Col. Edwin Pillsbury. The German management is to be removed, and the various plants owned by I. G. Farben are to be allowed to run for production purposes, but to a limited extent.

In accordance with the Belgium Government's provisional plan for the national economy, councils have been created to represent the country's commerial, industrial and artisan professions. On June 3, 1945, it was announced that a Professional Council for the Rubber Industry had been formed with a provisional committee including L. De Smeth, R. Destree, F. Jenatzy, J. Rens, H. Rifflard, A. Sas, C. Seffers, H. Steppe, F. Van Camp, and L. Van Hege.

In Italy, as in most European countries, the lack of fuel and raw materials is preventing resumption of manufacture, also by rubber and chemical concerns. Pirelli's large rubber works in Milan were practically unharmed by the war and are in good condition. But a smaller subsidiary plant making technical goods in the same city was almost completely destroyed by aerial bombings. Before the war the Italian rubber industry employed about 10,000 persons and manufactured a variety of goods including electric cables, tires, and tubes.

The plastics industry is apparently in the same position as the rubber industry. Inability to obtain formaldehyde, phenol, and resins has forced manufacturers to close down factories, and the production of urgently needed goods has been brought to a standstill.

PHILIPPINE ISLANDS

In the beginning of August it was learned that the shipment of rubber from the Philippines to the United States had been started again. In addition to 800,000 pounds of salvaged Japanese rubber, a shipment of 58 tons of crude rubber from a plantation at Kabacan, in South Central Mindanao, was sent out. The plantation, which was owned by Japanese, is now being operated under the supervision of the United States Army, having come under its Enemy Custodian branch. A steady increase in supplies of rubber from the Philippines is now expected.



Wartime limitations on raw materials have undoubtedly been the primary cause of sub-quality goods. It is possible too, however, that inaccurate working temperatures may have been contributory. Check the surface temperatures of your calender rolls with the Cambridge Roll Pyrometer as a matter of routine. This accurate, rugged instrument indicates surface temperatures of still and moving rolls. Write for bulletin 194S.



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Editor's Book Table

BOOK REVIEWS

"The New Plastics." H. R. Simonds and M. H. Bigelow, assisted by Joseph V. Sherman. D. Van Nostrand Co., Inc., 250 Fourth Ave., New York, N. Y. Cloth, 5½ x 8½ inches, 320 pages. Price $4.50.

This new book, published by the authors of the "Handbook of Plastics," contains quite an amount of valuable information. The style and presentation are identical with the guiding principles found in the Handbook.

It is rather difficult for the reviewer to find clear-cut dividing lines between the different chapter headings as, for instance, one called recent developments and another called new materials. A few more errors of this type may be found. These do not, however, detract from the value of this new book.

After a fairly detailed survey of the past of the plastics industry the ensuing three chapters deal with recent developments, new materials, and the improvement of older materials. The new borderline plastic materials, fibers, adhesives, and laminating materials are discussed in great detail.

Chapter nine is devoted to a careful consideration of synthetic rubbers. The various types of synthetic rubber and their manufacture and characteristics are studied. In addition to the major synthetic rubbers, Agripol (Norepol), made from soybean oil, Paracon (Paraplex X-100) a polyester-type which does not require carbon black for reenforcement, Marbon S and Marbon S-1, some of the new synthetic rubbers which have been developed recently, are described.

The book thus covers all new developments in the plastics, resin, and synthetic rubber fields fairly comprehensively. In conclusion the authors present a picture on the future outlook for plastics and append a list of chemical formulae for all newly developed plastics.

"A.S.T.M. Standards on Rubber Products" (with Related Information). American Society for Testing Materials, 260 S. Broad St., Philadelphia 2, Pa. December, 1944. Paper, 6 x 9 inches, 526 pages. Price $2.75 to non-members.

Committee D-11 on Rubber Products has published in the latest approved form some 76 standard methods, specifications, and recommended practices as well as definitions concerning rubber and rubber products. Aside from specific tests for rubber and synthetic rubber, specific types of rubber and rubber products such as automotive and aeronautical rubber, rubber hose and belting, rubber gloves and matting, rubber-coated fabrics, insulated wire and cable, hard rubber and cellular rubber, rubber cement and latices are considered for specific standardization procedures.

Very complete appendices cover specifications for related materials and purpose specifications, which may apply in individual cases, such as electrical tests giving information and specifications concerning insulating requirements. The war conditions have been taken into consideration with additional tentative specifications covering the particular wartime problems.

"Plastics Catalog. The 1945 Encyclopedia of Plastics." Plastics Catalogue Corp., 122 East 42nd St., New York 17, N. Y. Cloth, 11½ by 8¼ inches, 1178 pages. Index. Price $6.

This year's edition of the "Plastics Catalog" is again an up-to-date compendium of materials, processes, engineering, machinery, and products as well as production methods. Specific attention is given in this issue to the inroads made in the entire plastics field, due to the accelerated tempo of research and production induced by the war. The scientific level of the book has been raised, and a larger section is devoted to research results, tests, specification, and chemistry.

The section on synthetic rubber and rubber-like plastics consists of 20 pages. Butadiene copolymers, chloroprene polymers, isobutene-di-olefin copolymers, isobutene polymers, vinyl polymers, and organic polysulphides are considered in detail. Other rubber-like synthetics considered are: elastomeric styrene derivatives, and polyester elastomers.

The well-illustrated articles on the specific products are short, explanatory accounts of the properties, production, and use of each specific product.

Nine charts augment the written material, giving an overall record of the products and their properties. One chart devoted to the properties of synthetic rubbers lists the 11 most important commercial rubbers with careful consideration of all their physical

and chemical properties. These data are based on information received from the manufacturer and the technical literature as well as on A.S.T.M. specifications. A directory for materials, manufacturers, equipment, and molders is appended. A glossary, bibliography on plastics, and a listing of schools teaching plastics courses are of further value.

NEW PUBLICATIONS

"Melamine." American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y. 24 pages. This new illustrated booklet discusses the different derivatives obtained from melamine and their practical application. Of specific interest should be: Melamac resins for paint and varnish products, Parez 607 for waterproofing of paper, Permel for spotproofing, Aerotex M-3 for textile creaseproofing, and Melamac plastics for molding, adhesives, laminating, and related operations. Formulae and reactions are fairly well described, and an extensive part of each article is devoted to the history, development, and industrial application of each discussed item.

"Neoprene Industrial Rolls." Report No. 45-1. L. S. Bake, E. I. Du Pont de Nemours & Co., Inc., Wilmington 98, Del. 16 pages. For many years only natural rubber could be used for the manufacture of industrial rolls as hardness could only be satisfactorily varied with milled natural rubber. Now, however, du Pont has succeeded in adapting neoprene for this purpose, and neoprene can give as satisfactory a service as natural rubber. Varying degrees of hardness and resiliency can now be obtained with neoprene. The booklet deals with the adaptation of neoprene in the manufacture of industrial rolls. Compounding ingredients and the processing and building of the neoprene rolls are discussed in great detail, and all possible varieties and types of industrial rolls and their manufacture from neoprene are considered.

"The Effect of Varying Quantities of Ethylene Glycol on the Properties of GR-S Stocks Containing Silene EF." Columbia Pigments Data Sheets, No. 45-1. Pittsburgh Plate Glass Co., Columbia Chemical Division, Grant Bldg., Pittsburgh, Pa. The effect of ethylene glycol on rubber stocks compounded with hydrated calcium silicate is treated in this pamphlet, which confirms the observations of F. W. Gage[1] published recently in INDIA RUBBER WORLD. It has been stated by both that the addition of ethylene glycol improves greatly the qualities of GR-S that has been milled with hydrated calcium silicate (Silene EF) instead of carbon black. Ethylene glycol speeds the rate of cure; the hysteresis heat built up during milling is lowered, and the flex and water resistance are improved.

[1] "High Hardness Water-Resistant Neoprene Stocks," INDIA RUBBER WORLD, Aug., 1945, p. 590.





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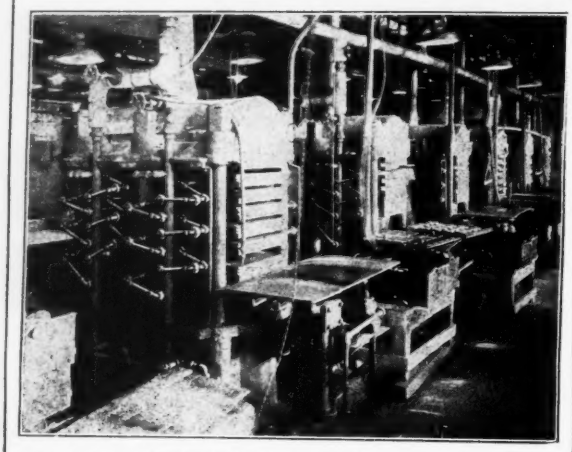
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"Textile Research Department." Bulletin 302. American Viscose Corp., Marcus Hook, Pa. 32 pages. American Viscose Corp. has prepared a new booklet describing and illustrating the work done by its textile research department, which is primarily research on new developments, that is techniques, new machinery, new fabrics, new fibers for new uses, and new uses for existing fibers. Cotton system, woolen system, and worsted system spinning, warping, weaving, knitting, dyeing, and finishing are all processes under continuous investigation as to possibilities of further improvement.

"Looking into the Sun." The Sun Rubber Co., Barberton, O. 32 pages. This new catalog by Sunruco shows the future and postwar possibilities of its rubber products. In a brief retrospect the war activities of the Sun Rubber Co. are shown, and the growth of the plant is demonstrated from its start in 1923 up to today. Before the war Sunruco produced among other items rubber toys for children. When war came, the company combined its prewar experience and war born necessity, and when the production of gas masks was started, it developed together with Walt Disney a Mickey Mouse gas mask, which in its way would have enabled the youngsters to take the war in their stride. Molded rubber goods, masks, respirators, rubber bellows and flexible tubing, grommets, gaskets, rubber bonded metals, fuel cells and fittings, and self-sealing gas tanks were produced during the war. Now with reconversion possible, Sunruco believes that with its added facilities, necessitated by the war emergency, a much more complete, efficient, and modern service can be rendered. The firm hopes to expand and develop further the fields of its prewar activities and to enter into new fields which may have great possibilities in the application of molded rubber products.

"3-M Adhesives in Industry." Minnesota Mining & Mfg. Co., St. Paul 16, Minn. 12 pages. This new booklet should be of interest to users of adhesives, sealers, coating and insulating compounds, impregnators, and sound-deadeners. The pamphlet illustrates and describes adhesive operations in many different industries and methods of application and gives a listing of the physical properties. It lists various formulae and shows the viscosity, bonding range, color, weight, characteristics, and uses for these new adhesives. Government specifications are also taken into consideration. An adhesive project sheet is contained in the leaflet enabling the reader to analyze the individual adhesive problem.

"We Are There." Written and illustrated by T. H. Chamberlain. Issued by American Flange & Mfg. Co., Inc., 30 Rockefeller Plaza, New York 20, N. Y. Cloth, 6 by 9 inches. 60 pages. This book is a tribute to our allies in the war, not only to the strong powers, but also to the peoples of the lesser countries—though smaller in military might, none the less strong in spirit and faith. Narratives of various countries, India, Burma, China, Bali, Africa, etc., are accompanied by illustrations of the natives of that particular country. Volume 1 of "We Were There," published in 1943, is also included. This book follows the same pattern used in "We Are There."

"Firestone Research." Firestone Tire & Rubber Co., Akron, O. 40 pages. It is the purpose to introduce to the public by means of this well-illustrated booklet the newly built Firestone laboratory and to acquaint the reader with all the products which have been developed through Firestone research during the war. The booklet also shows in brief retrospect the beginning and development of the Firestone company and discusses the postwar possibilities for many newly developed products.

"Coil-O-Clave." Union Iron Works, Erie, Pa. 4 pages. This new catalog describes a new development for autoclave and process kettle heating. Instead of a jacket, coil tubes are welded into the exterior wall of the vessel. This new method has the following advantages over the old jacket system: a higher rate of heat transfer, better heat control, suitability for high-temperature and high-pressure work, light weight of the unit, and little or no chance for corrosion. All types of standard and special vessels can be equipped with the new system.

"1945 Airplane Handbook." The Tire & Rim Association, Inc., 2001 First-Central Tower, Akron, O. 52 pages. **"Make the Skyways Your Highways."** Firestone Tire & Rubber Co., Akron, O. 20 pages. **"The Road Back Is the Road Forward."** American Management Association, 330 W. 42nd St., New York, N. Y. 16 pages. **"Twentieth Report to Congress on Lend-Lease Operations.** For the Period Ended June 30, 1945." Superintendent of Documents, United States Government Printing Office, Washington 25, D. C. Price 20¢. 64 pages.

"Rolling on Rayon." Industrial Rayon Corp., Cleveland, O. 16 pages. This new booklet tells the story of rayon's use in tires and why during the war the use of rayon increased to 20 times its prewar volume. Sketches are used to explain the basic differences between rayon and natural fibers; these differences are the factors influencing the final quality of the tire. The publisher of the booklet claims that rayon cord tires are lighter, have a longer life, and drive cooler and safer regardless of whether synthetic or natural rubber is used. Similarly illustrations and text are used to show how rayon is manufactured. Special methods of spinning, twisting, twist-setting, coning, and weaving are considered in some detail as these specific methods give the rayon yarn, cord, and fabric especially desirable properties.

"Processing Neoprene Stocks Containing Litharge," BL-198. 3 pages. **"Colors for Latex,"** BL-199, 7 pages. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. BL-198 gives several recommendations for the processing of neoprene containing litharge: use mill mixing wherever possible, use a two-part mixing procedure and others. BL-199 contains tables of recommended colors for latex, parts by weight table, and a table of neoprene latex color recipe, to name a few. In addition there are notes on leaching, curing, finishing, and other useful information. It is emphasized that colors must have three inherent properties: namely, easily dispersible in water, completely compatible with the latices, and unaffected by the alkalies and dispersing agents usually found in natural and synthetic latices.

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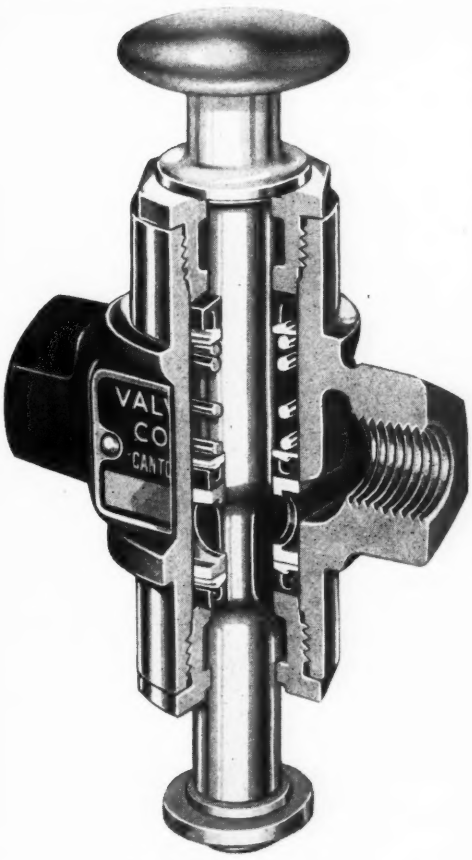
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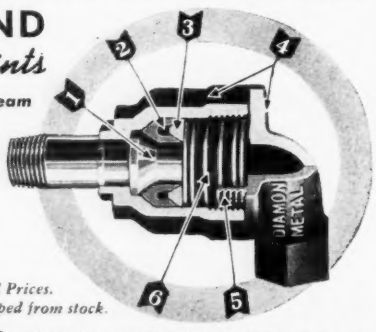
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Market Reviews

COTTON & FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

Futures	July 28	Aug. 25	Sept. 1	Sept. 8	Sept. 15	Sept. 22
Nov.	22.79	22.49	22.61	22.86	22.92	22.79
Dec.	22.79	22.53	22.62	22.80	22.94	22.84
Feb.	22.79	22.55	22.56	22.81	22.86	22.82
Apr.	22.77	22.60	22.52	22.76	22.87	22.79
June	22.63	22.46	22.28	22.58	22.72	22.65
Aug.	22.36	22.23	22.74	22.10	22.28	22.25
Oct.	22.03	21.65	21.08	21.45	21.67	21.76

SPOT middling prices did not fluctuate to a great extent in September. The low of the month was on September 1, with a quotation of 23.01¢, and the high was reached September 11, 23.48¢. The closing price of 15/16-inch middling was 23.47¢ on October 1. Buying was weak as the mills do not require much material now.

Futures were in general quiet. This condition may be attributed to a certain amount of hesitancy induced by the expectation of far-reaching revisions of government controls. In the latter part of the month futures were influenced by the pessimistic outlook on the crop, due to crop damage sustained by unfavorable weather, the hurricane, and weevil. Some slight gains during the middle of the month were induced by the optimistic postwar outlook presented in President Truman's message. The steadying influence on the market in general may be attributed to very light mill demands. November futures ranged between a low of 22.67¢ on September 8 and a high of 23.02¢ on September 15.

The Crop Reporting Board of the United States Department of Agriculture forecast a cotton crop of 10,260,000 bales, 500 pounds gross weight, for the 1945-46 season, compared to 12,228,000 bales for the 1944-45 season. Frequent rains during August and forecasts of early frost as well as the fact that the smallest acreage in 60 years has been planted contributed to the low forecast.

Fabrics

The fabrics market in general was very quiet and somewhat depressed in September, as manufacturers were expecting further clarification on price ceilings set by OPA. Toward the end of the month, when the final revisions for ceilings were announced, sales of sheetings revived. The market looked favorably toward a revision of M-317A, after which a considerable increase in business is anticipated. Owing to military contract cancellations heavy materials, such as ducks, were more available, and even while most activities were at a standstill, slight selling continued with these heavy materials. Thus while there was not much active selling throughout September, the outlook for the fourth quarter is good.

On September 20 the government lifted restrictions on the exportation of cotton duck rejects, permitting export on rated as well as unrated orders.

The Army will be 100% out of the duck and webbing market as of October 1, and last month took only a slight fraction of the amounts of these fabrics originally contracted for. Third-quarter contracts had called for deliveries of 90,000,000 square yards of duck and of 180,000,000 linear yards of webbing, involving expenditures of some $78,000,000. During the last half of this (third) quarter the Army took only 4,500,000 square yards of duck and about 2,000,000 linear yards of webbing. The duck will be used for cots and cot covers for the Army, and for protective coverings for the War Shipping Administration and for the Maritime Commission. Webbing delivered through September 30 included certain types of medical supply fabrics and webbing of the type used in parachutes for the Army Air Forces.

During the first half of 1945 the Army had been taking almost 100% of all duck and webbing manufactured. Duck procurement in the first six months of this year was about 300,000,000 square yards, and during the same period the Army bought about 320,000,000 linear yards of webbing. These figures include yardages of these fabrics bought for the Navy, FEA, WSA, and essential industry.

With military contract terminations making cotton fabric more plentiful for civilians, WPB on September 5 revised the basic wartime cotton distribution order to place most of the 134 fabrics it controlled on the free market. The revisions were made to M-317A, which set up preference ratings and restrictions and which required a fabric manufacturer to set aside up to 100% of his total production for military and other rated orders. Under the amendment, the Column V set-aside is no longer required except for four fabrics: osnaburgs, Class A and B sheetings, and Canton flannel. Of the remainder of the fabrics listed in the order, a manufacturer now needs to set aside goods only for export. He is still required, however, to fill all rated orders. Other restrictions removed from the order previously appeared in Column VI and included export restrictions, distribution provisions and end-use limitations. Remaining in Column VI are certain requirements for Canadian export.

Direction 21 to Conservation Order M-328, covering the production and distribution of cotton and synthetic fiber tire and fuel cell cord, was revoked September 11.

A producers' ceiling of 43¢ a pound has been established for 2200-denier high tenacity rayon yarn used in truck tires, in Amendment No. 9 to MPR 167—Rayon Yarn and Staple Fiber—effective September 25. The ceiling merely continues the adjusted price granted by OPA to cover the increased costs of the only wartime producer, E. I. du Pont de Nemours & Co., Inc. The new price is based on the costs of a producer of yarn made in a converted plant. If new plants designed for production of 2200-denier yarn begin to make this item, this ceiling may be reviewed.

New York Quotations
October 1, 1945

Drills		
38-inch 2.00-yard	yd.	$0.195
50-inch 1.52-yard		.29
52-inch 1.85-yard		.23875
52-inch 2.20-yard		.20511
59-inch 1.85-yard		.25202
Ducks		
38-inch 2.00-yard S.F.	yd.	.22875
40-inch 1.45-yard S.F.		.3086
51½-inch 1.35-yard D.F.		.33875
72-inch 1.05-yard D.F.		.45476
Mechanicals		
Hose and belting	lb.	.4225
Tennis		
51½-inch 1.35-yard S.F.	yd.	.33148
51½-inch 1.60-yard D.F.		.29218
Hollands — Rubber		
20-inch	yd.	.1225/.145
30-inch		.22 /.2575
40-inch		.245 /.29
Osnaburgs		
36-inch 2.94 Cl.	yd.	.1271
40-inch 2.11 P.W.		.1623
40-inch 2.65 Cl.		.1408
40-inch 3.65 Cl.		.10946
Raincoat Fabrics		
Cotton		
Bombazine 64 x 60, 5.35	yd.	.1375
Bombazine 64 x 56, 5.50		.1350
Print cloth, 38½-inch, 64 x 60		.09252
Sheeting, 40-Inch		
48 x 48, 2.50-yard	yd.	.172
64 x 68, 3.15-yard		.14761
56 x 60, 3.60-yard		.12638
44 x 40, 4.25-yard		.10352
Sheetings, 36-Inch		
48 x 44, 5.00-yard	yd.	.091
40 x 40, 6.15-yard		.07398
Tire Fabrics — Karded Peeler		
Builder		
17¼ ounce 60" 23/11 ply	lb.	.48
Chafer		
14 ounce 60" 20/8 ply	lb.	.48
9¾ ounce 60" 10/2 ply	lb.	.45
Cord Fabrics		
23/5/3, 1 7/32" cotton	lb	.44
15/3/3, 1 7/32" cotton	lb.	.42
12/4/2, 1 7/32" cotton	lb.	.42
23/5/3, 1¼" cotton	lb.	.44
Leno Breaker		
8¼ ounce and 10¼ ounce 60"	lb.	.45

SCRAP MARKET

AS IS the case with the reclaimer, the rubber scrap dealer's greatest difficulty at present is the separation of natural from synthetic scrap rubber. The recent OPA ruling which added a new classification to include mixtures of natural and synthetic rubber peelings, such as recap and retread tire materials, has reportedly not been of much help. The problem of separation is so difficult and so time-consuming that it is slowing production of splitters and reclaimers alike. Meanwhile demand for the better grades of natural rubber scrap continues high, but the demand for even well-identified synthetic rubber scrap, such as inner tubes, is not very great.

Scrap Rubber Ceilings

	¢ per Lb.
Inner Tubes†	
Red passenger tubes	7½
Black passenger tubes	6¾
Truck tubes	6½
Tires‡	$ per Short Ton
Mixed passenger tires	20.00
Beadless passenger tire	26.00
Mixed truck tires	20.00
Solid tires	36.00
Peelings†	
No. 1 peelings (natural and synthetic)	52.25
(Recap or retread)	44.41
2 peelings (natural and synthetic)	33.00
(Recap or retread)	28.05
No. 1 light colored (zinc) carcass	57.75
Miscellaneous Items*	
Air brake hose	25.00
Miscellaneous hose	17.00
Rubber boots and shoes	33.00
Black mechanical scrap above 115 sp. gr.	20.00
General household and industrial scrap	15.00

† All consuming centers except Los Angeles.
‡ Akron only.
* All consuming centers.



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THE demand for reclaim continued to climb during the past month and is now higher than during the war period. However the difficulty in securing adequate manpower, the loss of time separating synthetic from natural rubber scrap, and the longer processing time for scrap containing even small amounts of synthetic rubber have all had the result of making it more difficult for reclaimers to maintain a high production rate. According to the WPB Rubber Industry Advisory Committee meeting report, reclaim production now is about 20,000 to 21,000 tons a month, whereas the requirement is for 24,000 tons a month or more. Reclaim may therefore be one of the types of rubber that will be short during the next year or more.

Reclaimed Rubber Prices

	Sp. Grav.	¢ per Lb.
Auto Tire		
Black Select	1.16-1.18	7 / 7¼
Acid	1.18-1.22	8 / 8¼
Shoe		
Standard	1.56-1.60	7½/ 7¾
Tubes		
Black	1.19-1.28	11¾/12
Gray	1.15-1.26	12½/13½
Red	1.15-1.32	12½/13
Miscellaneous		
Mechanical blends	1.25-1.50	5 / 6

The above list includes those items or classes only that determine the price bases of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

Statement of INDIA RUBBER WORLD

Statement of the ownership, management, circulation, etc., required by the Acts of Congress of August 24, 1912, and March 3, 1933, of INDIA RUBBER WORLD, published monthly at New York, N. Y., for October 1, 1945.

State of New York }
County of New York } ss.

Before me, a notary public in and for the State and County aforesaid, personally appeared B. Brittain Wilson, who, having been duly sworn according to law, deposes and says that he is the Business Manager of INDIA RUBBER WORLD and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and address of the publisher, editor, managing editor, and business managers are: publisher, Bill Brothers Publishing Corp., 386 Fourth Ave., New York 16, N. Y.; editor, Robert G. Seaman, 386 Fourth Ave., New York 16, N. Y.; managing editor, S. R. Hague, 386 Fourth Ave., New York 16, N. Y.; business manager, B. Brittain Wilson, 386 Fourth Ave., New York 16, N. Y.

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B. BRITTAIN WILSON
Business Manager

Sworn to and subscribed before me this 18th day of September, 1945.

[SEAL] WM. A. LOW.

Notary Public, Queens Co. No. 1552, Reg. No. 138-L-7. Certificate filed in N. Y. Co. No. 657, Reg. No. 338-L-7.

(Commission expires March 30, 1947)

Postwar Increase in Plastics

(*Continued from page 93*)

cost of production at this time is too high. However the automotive engineers are working on a practical adaptation of plastics for structural members, Mr. Landes said.

"If the building industry has the activity economists predict, we can look to possibly $75,000,000 a year in plastics purchases—25% of our present annual volume. Plastics would be used in fabricated and semi-fabricated form.

"The electrical appliance, radio and television, telephone equipment, packaging, insulation, and toy industries all will use greater amounts of many different types of plastics materials. An analysis of the 72 basic industry groups listed by the Department of Commerce discloses that there are few perishable goods, semi-durable goods, durable goods, producers' goods, wearing apparel, or construction industries which cannot use plastics in some way."

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TIRE DEVELOPMENT ENGINEER—Knowledge of mold construction and equipment design. Good opportunity for man who can qualify. Eastern location. Write, giving details of past experience and salary expected, to Box No. 302, care of INDIA RUBBER WORLD.

SUPERINTENDENT OF TUBE DIVISION—Knowledge of compounding, extruding, handling of raw tubes, curing and packing. Give details of experience and salary expected. Write, Factory Manager, Armstrong Rubber Co., West Haven 16, Conn.

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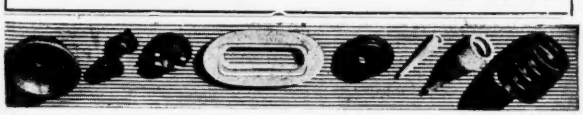
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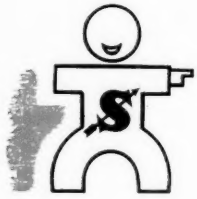
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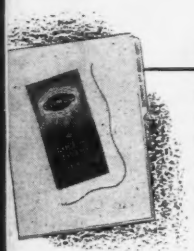
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